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DEPARTMENT OF THE ARMY  
Fort Detrick  
Frederick, Maryland

AUG 30 1964

# CZECHOSLOVAK METHODS OF PLANT PROTECTION (INCLUDING BW ASPECTS)

Source not given,  
pp 5-61, 70-87,  
90-91

## Methods to Protect Individual Plants

Plant and harmful factor	Preparative	Treatment	Portion of preparative and water*) in liters/ha	Time of treatment, signalization data	Date of last treatment before harvest (days)**)
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### CEREALS

Sticky and dwarfish blight (Tilletia spp.)	Agronal H	Soaking of seeds	200 g/q	Before sowing	-
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Agrotechnical time-limits for sowing must be maintained. Obligatory soaking of all seeds according to the law.

Snow mould (Fusarium nivale)	Agronal or Agronal H	Soaking of seeds	200 g/q	Before sowing	-
Stripe blight (Helminthosporium graminum)	Snow blight - rye should be sown in more compressed soil within optimum agrotechnical time-limit. If ryes are damaged by snow blight when snow melts away, they should be run over carefully with light harrow. Plants which have been pulled out by frost should be rolled over by a grooved roller and fertilized with nitrogen fertilizers. For the benefit of agricultural establishments in districts lying at an altitude of 500 m above sea level and over and having an annual average				
Hard barley smut (Ustilago hordei)					
Stem smut (Urocystis occulta)					

Plant and harmful factor	Preparative	Treatment	Portion of prep. and water*) data in lit./ha	Time of treat., signalization data	Date of last treat. before harvest (days)**
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precipitations of more than 700 mm, with average summer temperature of below 15° C (June-August), seeds should be provided on a contract basis through exchange with agricultural establishments located in lower and drier areas with annual average precipitations of less than 550 mm and an average summer temperature (June-August) of more than 17° C. Rye fields used for seeding should not be located in humid and cold areas. Rye should be fertilized in the autumn according to the results of an analysis of soils dealing with the content of nutritious substances which include sufficient amounts of all basic nutrients in a balanced ratio. In acid soils the soil reaction should be balanced by calcination or fertilization with alkaline fertilizers. Agronal H should be used only when Agronal is not available. Obligatory soaking of all seeds according to the law is handled in accordance with CSN /Czechoslovak Norm/ 46 5820 "Soaking of seeds of cereals, beetroot, and flax in dry mordant". Rye seeds should be produced in low-lying areas whenever possible.

Oat smuts (Ustilago avenae, Ustilago levis)	Formalin 40% or	Soaking of seeds	37.5 ccm 40% of formalin and 262.5 ccm of water per 1 q of seeds	Before sowing	-
	Panogen 0.8	Soaking of seeds	300 ccm/1 q of seeds	Before sowing	

#### Timely sowing

Formalin is used for soaking in a soaking drum with a tight cover of a pour-in type. The drum is filled with seeds from  $\frac{1}{2}$  to  $\frac{2}{3}$ , then the appropriate quantity of formalin solution is poured evenly over the entire surface of the seeds. We close the drum quickly and turn it 5 - 10 minutes. After soaking the seeds are poured directly in bags which are closed immediately. The best way is to sow the seeds the next day after the soaking. The seeds are practically dry after the soaking, so that they do not require any further treatment and we do not have to increase

Plant and harmful factor	Prepara-	Treat-	Portion of prep. and water*)data in lit./ha	Time of treat., signalization	Date of last t. b. har. (days)**)
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the amount of seeds. The capability of germinating is affected less than in the previous method of soaking in formalin even when the soaked seeds have been stored for a long period of time. We should use only pure formalin without any precipitation. Seeds soaked in formalin can be stored for a maximum of one month. Panogen is planned for soaking of oat seeds for propagating areas. The soaking is done by the SSP Chocen.

Oat and wheat smut (Ustilago nuda, Ustilago tritici)	Hot water or anaerobic soaking	Soaking of seeds	Before sowing
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We soak only selected seeds. The soaking is done by the SSP Horni Mostenice.

The seeds are soaked for 2-4 hours in water at temperature of 20-22°C. The water is strained and the moist seeds are closed for 4 days at an even temperature in airproof covers equipped with safety seals. After that the seeds are dried.

Grass mildew  
(Erysiphe graminis)

Spring barley should not be sown next to winter barley. Balanced fertilization with nitrogen, phosphorus and potassium.

Chaff rust  
(Puccinia glumarum)

In areas where the rust occurs frequently we should use resistant varieties of wheats: winter variety such as Hadmerslebener, Qualitas, Kasticka osinatka ("Kastice awn"), and spring wheats such as Zlatka, Remo.

Grass rust/ pre-  
sumably wheat  
rust, cf. trans. /  
(Puccinia graminis)

Early varieties of wheats should be sown in areas where this rust occurs frequently. Barberry in the proximity of fields should be destroyed.

Virous sterile dwarfish-ness of oat	Aerosol DDT or Intracidal or Dynocid	Aerosolization	6 lit. sowing early 6 lit. in the spring 30 kg	-
	Spray			

Plant and harmful factor	Preparative	Treatment	Portion of prep. and water*) data in lit./ha	Time of treat. signalization data	Date of last t. b. har. (days)**)
Wireworms (Elateridae)	Gamacid or Supergam	Disinfection of soil	100 kg/ha 200 kg/ha	before sowing of cereals	-

Soil is disinfected according to the results of soil digging when there are more than 10 wireworms per 1 m<sup>2</sup>. After spraying the preparative must be harrowed.

Green-corn hunch-back / (Zabrus gibbus)	Lidykol	Spray	3 kg	immediately when it begins to appear (not later than before sprouting)
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Cereals should be alternated with leguminous plants and beetroots. We should make sure that there are no cereals growing in the field from spilt seeds. If the growing plants must be plowed in, we have to sow substitute plants, for example millet or (mixtures) ("smesky"). When it appears at edges of fields, we treat only the endangered edges.

Plant lice (Aphidoidea)	Intrasol 3	Aerosolization	6 liters	When spreading in large numbers (before the sprouting of the plants at the latest)
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Plants which have been treated must not be used as green fodder.

Chloropid flies (Oscinella spp.) and /acalyptrate flies / (Chlorops spp.)	Lidykol	Spray	3 kg	At first symptoms or when imagoes appear in the plants
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Lidykol can be combined with Dikotex 40, if we treat the soil while the plants are sprouting.

Thrips (Thysanoptera spp.)	Fosfotion	air spray	3 lit./ 50 lit.	When the plants are endangered
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Plant and harmful factor	Preparative	Treatment	Portion of prep. and water*) data in lit./ha	Time of treatment, signalization data	Date of last t. b. hav. (days)**)
CEREALS WITHOUT ADDITIONAL SOWING	Dikotex 40 or	Spray	2-3.5 lit./200-300	After full development of the 4th leaf of cereals	21 before using
Weeds (dicotyledonous)	Dikotex 40 or	Aerosolization	2-3.5 lit. add water to make 6 lit.	to the beginning of sprouting	as green fodder
	Dikotex P or	Spray	1.5-2 kg/200-300		
	Agrion or	Spray	1.5-2 kg/200-300		
	Rafex 35	Spray	6-9 kg/600	When the cereals are 10-30 cm high	

Ordinary weeds are annual -- they require timely harrowing by means of net harrows, as the weeds grow blindly, and during picking of weed. For extermination of agropyron, see page 54. When we apply water spray from an airplane, we use doses of 100 liters of water per 1 ha. Aerosol is applied from the ground (Solgen R. S-014) or from an airplane. Aerosolization is carried out in the morning or afternoon, with wind speed up to 2.5 m/sec, in the case of spray from airplane 1.5 m/sec against the wind. The water used for Dikotex should be as soft as possible. Growth herbicides (Dikotex, Agrion) are most effective when the weeds have 4-6 true leaves, contact herbicides (Rafex 35) when the weeds have 2-4 true leaves. We use Rafex 35 in cultivations where the predominant weeds are those which are resistant to growth herbicides (knotgrass, hemp nettle, chamomiles, chickweed, pondweed, nettles, speedweed, etc.), we use Rafex 35. Rafex 35 is applied at low pressure in the form of large drops (flax spray-guns). At a temperature of about 20°C, when the weeds are sensitive, it is enough to use a dose of 2 kg of Dikotex 40 per 1 ha. In principle the plants should not be sprayed all over. The spraying should depend on the location of the weed and should be done only when the amount of weed is considerable.

CEREALS WITH SECONDARY SOWING OF a) ALFALFA AND RED CLOVER weeds (dicotyledonous)	Rafex 35	Spray	6 kg/600	A week before additional sowing of secondary crop	
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Plant and harmful factor	Prepara-tive	Treat-ment	Portion of prep. and water*) data in lit./ha	Time of treat., signalization data	Date of last t. b. har. (days)**
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Only in those areas where we sow subsequently Trifolium herbs in addition to cereals.

b) RED CLOVER weeds (dicotyledonous perennial)	Dikotex 40 or	Spray	2 lit./400	At a time when the sub-crop develops 2 trifoliolate leaves	-
	Legumex M or	Spray	6-8 lit./400		
(annual)	Dinoseb	Spray	4-6 lit./600		

When we use Dikotex and Dinoseb, thick cereals and weeds must cover the secondary crops. spray-guns  
To be sprayed by means of flax/ at low pressure (up to 5 atmospheres).  
Do not spray at temperatures above 25°C and when the sun is hot, so that the crops would not be damaged.

c) WHITE AND SWEDISH CLOVER weeds (dicotyledonous)	Legumex M	Spray	6-8 lit./400	When the sub-crop develops one trifoliolate leaf	-
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Legumex M does not destroy field mustard.

d) ALFALFAS	Legumex D or	Spray	6-8 lit./400	When the sub-crop has developed 2 trifoliolate leaves	-
(annual)	Dinoseb	Spray	4-6 lit./600		

Legumex D does not destroy field mustard.

#### ATTENTION

We should not use growth herbicides on soil in close proximity to vineyards, hop gardens, orchards, nurseries, and other sensitive cultures. The danger of damaging sensitive cultures is increased considerably when we make the sprays from a plane and when we apply Solgen R. For that reason we are not allowed to use growth herbicides for sprays from an airplane in areas where grape wine and hops are cultivated. Growth herbicides Dikotex, Agrion, Legumex M and D are less effective when they are applied at temperatures below 10°C. The use of growth herbicides in the proximity of



Plant and harmful factor	Preparative	Treatment	Portion of prep. and water*) data in lit./ha	Time of treat., signalization data	Date of last t. b. har. (days)**
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state boundaries are regulated by directives of the MZLVH, see attachment on page 104.

CORN	Hermal L	Soaking of seeds	400 g/q	-	
smut ( <i>Ustilago maydis</i> )					
anther smut ( <i>Sorosporium rellianum</i> )					
fusariosa					
grubs ( <i>Melolontha</i> sp.)					
wireworm ( <i>Elateridae</i> )					
"kvetilka vsezrava" ( <i>Chortophila florilega</i> )					

Corn smut: do not sow corn too early. After harvesting, remove corn straw with batches, smut from the field and burn it. Blighted tumors should be cut off, if they do not spread dust, only in seed cultures, and they should be removed from the field. Soaking of seeds in Hermal L does not protect the plants against smut infection during the vegetation period. In case of a catastrophic appearance of wireworms we put 100 kg of Gamacid in the soil per 1 ha of land.

Wireworms and grubs ( <i>Melolontha</i> sp. and <i>Elateridae</i> )	Gamacid or Supergam	Disinfection of soil	100-200 kg 200-400 kg	During spring preparation of soil	-
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Same way as in the case of cereals.

Disinfection is carried out when there are more than 16 wireworms or 2-3 grubs per 1 m<sup>2</sup> of land. The seeds are soaked when there are 7-15 wireworms per 1 m<sup>2</sup>.

Weeds	Zeazin (Atrazin, Hungazin PK	Spray	3-4 kg	Immediately after dragging (especially in dry areas), but not later than before the corn takes root.	
	or Hungazin DT (Simazin)	Spray	3-4 kg		
dicotyledonous	Rafex 35	Spray	8-9 kg/600	When the corn is 8-10 cm high	
	or Agrion	Spray	1-1.5 kg/400	When the corn is 15-25 cm high	

Plant and harmful factor	Preparative	Treatment	Portion of prep. and water*) data in lit./ha	Time of treat., signalization data	Date of last t. b. har. (days)**
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When we do not use Zeazin or Hungazin PK, we use pre-sowing preparations: in the spring, after dragging, harrowing, and the appearance of weeds, we should use equipment with arrow-shaped flat-cutting plowshares and repeat the operation 2-3 times depending on the appearance of weeds, and we repeat the operation again for the last time shortly before sowing at the depth to which corn is sown. When the corn takes root and up to the stage of 3-4 leaves, we should harrow the soil by using light dragnet harrows, and when the cultivation grows we should use the harrows obliquely to the direction of the rows, while the soil is dry. Use weeding hoe during the stage of 4-5 leaves. Use weeding hoe at short intervals, depending on the appearance of weed. The corn is sown at least in 3 interlinear rows, first at the depth of 10-12 cm (10 cm protective belt), second at the depth of 6-8 cm, third at 4-6 cm.

In light sandy soil we use Zeazin (Hungazin PK, Atrazin) and Hungazin DT (Simazin) in 3 kg doses, in heavier soils we use doses of 4 kg/ha. The plants which follow corn and are taken care of by these herbicides are as follows: spring wheat, oats, peas, vetch, potatoes, or mixtures of legumes with wheat or oats and corn. If the weather was dry in the year when herbicides were applied, we must not use winter wheat and spring barley as the following crops. The following plants are particularly sensitive to the remnants of such herbicides: beetroot, clover, poppy, all types of vegetables, rape. As soon as we harvest corn which was treated with these herbicides, we should plow the soil deeper, and by doing so we decrease the danger that the following crops may be damaged. When we apply these herbicides before sowing, we must exclude the cultivation of soil at a depth of more than 5 cm. When we use Hungazin PK and Zeazin, we can reduce the number of cultivation operations to one harrowing or weed hoeing. When we apply herbicides, we must avoid the possibility that the spray belts may overlap.

We do not spray Agrion when there is danger of night frost, soon after weed hoeing, or when the cultures are weakened in some other way. If we are short of herbicides named above, we can use Dikotex 40 in maximum doses of 2 l/ha. However, corn may be damaged at higher temperatures.

MIXTURE OF CORN  
WITH PEAS, "PELUS-  
KA", BEANS, SOY  
BEANS  
weeds

Gesagard (Prometryn)	Spray	1-3 kg	Immediately after sowing, not later than before the plant takes root
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Plant and harmful factor	Preparative	Treatment	Portion of prep. and water*) data in lit./ha	Time of treat., signalization data	Date of last t. b. har. (days)**
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The upper limit of dosing is used in the dry weather and when the soil is heavier.

#### LEGUMES

fusarium and anthracnose	Hermal	Soaking of seeds	300 g/q	Before sowing	-
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Peas: fusarium -- we should use only healthy seeds which are of good biological value. We should sow the seeds in time, keep weeds out of the crops, and take measures in particular against bean weeds.

Anthracnose -- remove remnants of plants after harvesting, sow seeds only from healthy crops.

Beans: anthracnose -- use seeds only from healthy crops.

We recommend soaking of all seeds of peas and beans immediately after harvesting. It is also a protection against storage diseases. Soaking destroys only embryos on the surface of seeds.

Bruchidae beetles:	Pilomor	Disinfection of seeds	500 g/m <sup>3</sup>	Immediately after harvesting	-
pea beetle	or				
bean beetle					
lentil beetle	Hermal L	Soaking	400 g/q	Immediately after harvesting	-
vetch beetle, etc.					

The seeds are put in piles 40 cm high and are sprayed evenly with Pilomor. Piles treated in this way are covered with impregnated sheets in such a way that the edges of the sheets would overlap adequately at the edges of the piles. After 24 hours the sheets are removed and the seeds are aerated by tossing them over. We treat all seeds in sugar beet and corn areas.

Pea beetle and lentil beetle (Bruchus pisorum and B. lentis)	Aerosol DL or Gamadyn or Lidykol	Aerosolization	6 liters	During blossoming	-
thrips (Thysanoptera)		Dusting	20 kg		
gall midge (Cecidomyidae)		Spray	1 kg		

The treatment may be repeated at the end of the blossoming period, if necessary. The entire field is treated in corn and sugar beet areas.

Plant and harmful factor	Preparative	Treatment	Portion of prep. and water*) data in lit./ha	Time of treat., signalization data	Date of last t. b. har. (days)**
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Pea weevil (Ernarmoni spp.)	Aerosol DL or	Aerosoli- zation	6 liters	At the end of blossoming period	-
	Gamadyn	Dusting	20 kg		

Damaged grains should be removed from seeds by a needle-type sorter. Sowing should be done as soon as possible. Peas should be cultivated with oats as subsidiary plant (15-20 kg/ha). Peas should be thrashed as soon as possible after harvesting. The entire acreage is treated in corn and sugar beet areas.

"Striped leaf-eater" (Silona lineata)	Gamadyn or	Dusting	20 kg	When it appears in harmful number	-
	Lidykol or	Spray	1 kg		
	Aerosol DL	Aerosoli- zation	6 liters		

Repeat after 5-7 days as needed.

"kvetilka vsezrava" (Chortophila florilega)	Hermal L	Soaking of seeds	400 g/q	Before sowing	-
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Seeds of beans are soaked in those areas where the pest appeared in large numbers in 1963.

Poppy aphid (Aphis fabae) on beans	Intration or	Spray	0.4 liters	Before blossoming	-
	Intrasol 3	Aerosoli- zation	6 liters		

Particularly in corn and sugar beet areas.

Weeds (dicotyledonous)	Dinoseb	Spray	6 lit./600	When the culture is 5-15 cm high (1-4 ripe leaves of the legume)	
Weeds	Gesagard (Prometryn)	Spray	1-3 kg		

Immediately after sowing, not later than before the plant takes root

Plant and harmful factor	Preparative	Treat- ment	Portion of prep. and water*)data in lit./ha	Time of treat., signalization data	Date of last t. b. har. (days)**)
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Dinoseb can be used only on peas, Peluska, beans and mixtures combined with cereals. The spraying should be done by larger drops through flax nodules at low pressure, maximum 5 at. We should not spray at temperatures above 25°C and hot sunshine, so that the crops would not be damaged. Prometryn is used in lentil, soy bean, peas, "Peluska" beans. The upper limit of dosing is used during dry weather and in heavier soils. Maximum dose for soybeans is 2 kg

SUGAR BEET AND TURNIP (Cercospora lenticula)	Kuprikol or	Spray	8 kg/400	Approximately	
				from the begin-	14
				ning of July,	
				depending on	signals
	Banacobre OL	Spray by	4-5 kg/100		
	or	aircraft			
	Miroxyd or	Dusting	40 kg		
	Aerosol Cu 25	Spray	6 liters		
		by aircraft			

Remnants of leaves and cuts left after harvesting should be removed and the soil should be plowed at great depth. Weed should be removed from sugar beet fields, and we should not put intermediary crops in sugar beet fields, especially poppy. We should not sow sugar beet in infected fields before a period of three years. We should separate the crops of factory sugar beet and planting crops from seedlings. Planting crops should be sown later. We should avoid soil where the humidity of the air is high. The plants are treated once to twice during the vegetation period. The preparative Kuprikol or Miroxyd is sprayed from an airplane where the cultures are well developed and are inaccessible to terrain machinery. The preparative Banacobre OL is applied only from the air. In addition to the preparatives enumerated in column 2 we can use imported preparatives, for example Vitigran konc, Kupritox, Koloidox, etc. The doses are made according to special instructions.

peronospora  
(Peronospora  
schachtii)

Method of protection in case of cercospora: keep the seedlings and planted crops isolated (500 m) according to the Czechoslovak norm CSN 46 2040.

Plant and harmful factor	Preparative	Treatment	Portion of prep. and water*) data in lit./ha	Time o. treat., signalization data	Date of last t. b. har. (days)**)
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Negative selection should be made in cultures of seedlings, or infected stems should be cut off. Plants with strong infection found in centers initial occurrence should be eliminated from the culture.

"Heart rot" (Srdeckova hniloba)	Borax	Fertilization	15 kg	In the spring before sowing, not later than before unification period	-
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Do not put too much calcium in the soil, preference should be given to fertilizers which are physiologically acid. Sugar beet, stalk legumes, alfalfa, and poppy require large amounts of boron and therefore should not be sown frequently in the same fields.

Borax should be added as additional fertilizers regularly under the crops of seedlings, and a dose is sufficient for a period of 5-7 years. Borax should be spread evenly, the best way is to mix it with fertilizers which do not contain ammonia. Crops of technical sugar beet should be treated only in those fields where "heart rot" appears regularly.

Sugar beetroot necrosis (Phoma sp., Pythium spp. etc.) "Maloclenec" (Atomaria linearis) Wireworms (Elateridae) grubs (Melolontha sp.)	Hermal L	Soaking of seeds	1600 g/q	-	-
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Sugar beetroot necrosis -- good preparation of soil, sowing should not be done too deeply and the soil should be at least 5°C warm. Stirring of the soil crust during vegetation period. Beetroot crop should not be followed by another beetroot crop. Beetroot seeds are soaked in a mordant, particularly in areas where "maloclenec" appears regularly.

"Maloclenec" (Atomaria linearis)	Lidykol	Spray	1 kg	When crops are seriously endangered	-
Wireworms (Elateridae)	Gamacid or	Disinfection of Soil	100-150 kg	During spring preparation of soil, after dragging	-
Grubs (Melolontha sp.)	Supergam		200-300 kg		

Plant and harmful factor	Preparative	Treatment	Portion of prep. and water*) data in lit./ha	Time of treat., signalization data	Date of last t. b. ur. (days)**
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When we prepare the soil, we should give preference to disc tools. Soil is disinfected when more than 10 wireworms appear per 1 m<sup>2</sup>. Soil is treated against grubs in those areas where swarms of cockchafer appeared during the previous year and larvae of the first and second development stage appeared in the digging of soil. The soil is disinfected in the spring before sowing, the preparatives are worked carefully into the soil immediately after application.

Springtails (Halticinae)	Dynocid or	Dusting	20 kg	When the pest begins to appear, studies should be made from the beginning of May	60
Weevils "lalokonosci" (Otiorrhynchus ligustici etc.)	Gamadyn or Dykol or	Dusting	20 kg		60
Clavicorn beetles (Silphidae)	Aerosol DDT	Spray	1.6 kg		60
	Aerosol	Aerosolization	6 liters		60

If there is danger that calandra weevils may appear, it is recommended that /text cut off, cf. trans. / on small protective ditches around alfalfa crops. The bottoms of the little crops are filled with Gamadyn.

"ryhonosci" (Bothynoderes punctiventris, etc.)	Gamadyn or	Dusting	20 kg		60
	Lidykol or	Spray	1 kg		
	Aerosol DL	Aerosolization	6 liters		60

When this pest appears, we must remember the small protective ditches around beetroot crops of previous year. We fill the bottom of the little ditches with Gamadyn.

Gamma moth (Plusia gamma)	Wofatox or	Spray	1 kg	Immediately when discovered	28
	Soldep	Spray	4 liters		14
"kvetilka repna" larvae (Pegomya betae)	Soldep or	Spray	0.6 liter	According to signalization	14
	Soldep or	Spray by airplane	0.6 lit./50		14
	Aerosol DTHP	Aerosolization	6 liters		14

Sowing should be done soon. Affected plants should be removed from the field during unification. Only one treatment is given. Second treatment is not economical. When aphides and "kvetilky" appear at the same time,

we can combine Soldep with Intration in usual doses.

A plant treated with Soldep should be worked on only four days after treatment, and a plant treated with Aercol DTHP only two days after treatment.

The treatment is carried out according to the principles given in the following table:

Protection	Number of leaves	Average number of live eggs on one plant	Note
recommended	cotyledon leaves	6 - 7	not unified, cut
	2 true leaves	8 - 9	unified beetroot
	4 true leaves	11 - 16	" " "
	6 true leaves	20 - 28	" " "
necessary	cotyledon leaves	8 and more	nonunified, cut
	2 true leaves	10 and more	unified beetroot
	4 true leaves	19 and more	" " "
	6 true leaves	29 and more	" " "

Plant and harmful factor	Preparative	Treatment	Portion of prep. and water*) data in lit./ha	Time of treat., signalization data	Date of last t. b. har. (days)**
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Eggs of aphides on host winter crops	Nitrosan or	Spray	1 %		-
	Arborol	Spray	3 %		-

In areas close to sugar beet fields, where eggs of poppy aphid (*Aphis fabae*) appear in medium and large amounts on host winter crops (spindle-three, reed-pipe), we should cut off and burn the branches which are covered with eggs or spray them during the period of vegetation rest.

Poppy aphid ( <i>Aphis fabae</i> )	Intration or	Spray	0.4 liters	According to signals	-
	Intraol 3	Aerosolization	6 liters		

Peach aphid (*Myzodes persicae*)

We limit the occurrence of the pest by using potassium fertilizers. When the pest appears in isolated cases, we should treat only the edges of the crops or the places where the aphidae appear. Planting crops and seedlings



Plant and harmful factor	Preparative	Treatment	Portion of prep. and water*) data in lit./ha	Time of treat., Date of signalization last t. b. harv. (days)**
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are treated to prevent the appearance of aphids, primarily in terms of a decrease of the occurrence of viruses, depending on signals, minimum 3-4 x during a visitation period. We begin the first treatment of seedlings approximately at the time when the first larvae of the aphid appear with clear signs of the formation of wings (nymsa) on host winter crops. The first treatment of seedlings is done at the same time with the treatment of technical sugar beet, the following treatments according to signals. When a plant has been treated, we must wait 7 days before working on the plant directly. We can work on the plant after 2 days, if we use rubber gloves.

In 1964 we shall treat at the time of signalization all crops of technical sugar beet in those districts where the prognosis is strong. In districts with slight prognosis we treat crops where the initial attack affects 5 and more percent of the crops. With regards to planting crops and seedlings we expect that the treatment will be repeated 3 to 4 times during a vegetation period.

Field noctua (Agrotis segetum, etc.)	Wofatox or	Spray	1 kg	When the pest is discovered (according to general signals)	28
	Lidykol or	Spray	5 kg		60
	Lidykol	Poured over	10 kg/4000		

Mechanical collection, deep plowing, early sowing.

We pour Lidykol primarily over concentrations of the pest.

We also dig small protective ditches around crops which have been strongly infected, and we pour Gamadyn over the bottom of the ditches. Exceptions from periods of protection are authorized by the MZLVH in agreement with the principal hygienist.

Sugar beet plesma (Plesma quadrata)	Wofatox or	Spray	1.2 kg		28
	Wofatox	Dusting	30 kg		

According to special directives of the MZLVH, see supplement on page 98. Direct handling of a treated plant is permitted after 7 days, and after 2 days (in exceptional cases) when we use rubber gloves.

Sugar beet nematode (Heterodera schachtii)

Plant and harmful factor	Preparative	Treatment	Portion of prep. and water*) data in lit./ha	Time of treat., signalization data	Date of last t. b. har. (days)**
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In contaminated areas we should not cultivate sugar beet or rape with mustard more often than every 4th year. We should eliminate host weed-type plants such as "Merlik", garden orache, "Ohnice", mustard, shepherd's bag, etc. We should include whenever possible enemy plants in the sowing cycle. Such plants stimulate the heterodera to crawl out of the cysts, but the hatched larvae cannot develop in their texture. These plants include chicory, onions, garlic, rye, corn, vetch, peas, horsebeans.

Sugar beet gnorimoschema (Gnorimoschema ocellatellum)	Lidykol or	Spray	3 kg		60
	Gamadyn or	Dusting	20 kg		60
	Aerosol DL	Aerosolization	6 liters		60

In order to make sure that as many migrating caterpillars as possible become pupas, we must do deep plowing not sooner than 10 days after the harvest of sugar beet has been completed. In order to establish hygienic control, we must report the treatment to the district hygienist, if the treatment took place within less than 60 days before the harvesting. We wipe off mites from the infected seedlings and cover the seedlings with a spray of Gamacidem (until the surface is white).

Weeds (annual)	Alipur	Belt spray	1.6 lit./	Simultaneously with sowing
		(belt 18 cm wide)	140-150	
		Surface spray	4 lit./600	Up to 3 days after sowing of sugar beet
	Murbetol	Belt spray	8-14 lit./	Simultaneously with sowing
		(belt 18 cm wide)	140-150	

We use special sprayguns which are mounted on drill seeders. The preparative is effective only in humid soil. For details see instructions for the use of the preparative.

The dose of the preparative in the case of Murbetol depends on the type of the soil.

#### POTATOES

aphids -- carriers of viruses (Aphidoidea)	Intration	Spray	1 liter	First spray immediately after the potato has taken root, next 2 sprays in 12-day intervals
	Intrasol 10	Aerosolization	6 lit.	

Plant and harmful factor	Preparative	Treatment	Portion of prep. and water*) data in lit./ha	Time of treat., signalization data	Date of last t. b. har. (days)**
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We treat improved crops, lead crops, and crops with high degree of multiplication (M1, M2), varieties which are susceptible to infestation by /potato tuberworm/ ("Svinutka") (Karmen, Rita, Jara, Hera, Krassava, Oslava, Jarabina, Capella, Vitava, Rajka, Tatránke).

Viruses	Rafex 35	Dessication	30 kg/900	In the case of early varieties around 15 July, in the case of late varieties by the beginning of August	
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We should plant healthy potatoes which are free of viruses. In warm areas the planting should be changed every year, in higher locations every second or third year. We should eliminate weeds and economize the humidity of the soil. We should make negative selection in seedling lots or reproduction areas. We should fight against aphids.

Dessication is applied only to planted potatoes with reduced vegetation period. Plants are made in accordance with SSP and ZNZP. For the technique of treatment see below -- dessication applied to potato mildew.

Potato mildew (Phytophthora infestans)	Novozir N 50 or	Spray	4 kg/600	According to signals	7
	Novozir N	Spray	8 kg/600		

We should plant only healthy potatoes which have not been attacked by mildew. Infected potatoes which have been picked up should not be left in piles outside, but they should be steamed and used as fodder in time. We should liquidate in time the first centers where mildew occurs. We contribute considerably to the protection of potatoes against infection by piling up arable land during plowing.

We treat first of all the entire acreage of reproduction areas under contract and nursery lots of early and semi-early varieties. We should concentrate primarily on early varieties in current potato-growing. Depending on the occurrence of primary centers of mildew and weather conditions, we carry out 2-3 preventive sprays which can be combined with treatment against Colorado beetle. Novozir N is used only until the supplies are exhausted. Kuprikol is used only according to special instructions of the MZLVH.

Rafex 35	Dessication	30 kg/900	When the disease affects 30% of the leaf area of the crops
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Plant and harmful factor	Preparative	Treatment	Portion of prep. and water*) data in lit./ha	Time of treat., signalization data	Date of last t. b. Har. (days)**
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Dessication is carried out only in reproduction areas and nurseries. The spraying is done so that the crops would be treated in both directions. The herbage is crushed by grooved rollers. When we destroy the herbage by a clod-crusher, we use smaller doses of Rafex -- 15 kg. Potatoes obtained from sprayed crops are harvested during dry weather, not sooner than 8-12 days after dessication, so that they would ripen. During the harvesting period the potatoes are left in the furrows to dry up and are stored temporarily. They are picked thoroughly before they are stored for the winter. Potatoes from crops treated with Rafex 35 may not be used for consumption.

Potato canker  
(Synchytrium  
endobioticum)

In areas which have been infected by this disease we should not cultivate those varieties of potatoes which are susceptible to canker: Erstling, Bintje, Rajka. Other varieties of the Czechoslovak assortment of potatoes resist the disease.

For all measures against this disease, see CSN 46 5831 "Protection against the spreading of potato canker".

Colorado beetle (Leptinotarsa decemlineata)	Inspection of crops	Once a week starting at the time when the potatoes take root
Dykol or Lidykol or	Spray	1.6 kg
	Spray	1 kg
Aerosol DDT	Aerosolization	6 lit.
or Aerosol DL	Aerosolization	6 lit.
or Gamadyn	Dusting	20 kg
or Dynocid	Dusting	20 kg

Inspections of the crops are obligatory on household plots and on small lots.

When we treat potatoes against the Colorado beetle, we use primarily a spray or aerosol. We dust only those areas where the spraying cannot be done. Dykol can be used only until the supplies are exhausted.

In the case of early and semi-early varieties the protection period for Aerosol DDT is 7 days, in the case of other preparatives 14 days.

Potatoes from treated crops must be washed before they are used as fodder.

Plant and harmful factor	Preparative	Treatment	Portion of prep. and water*) data in lit./ha	Time of treat., signalization data	Date of last t. b. har. (days)**
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In all zones the blighted areas are treated once at a time when the youngest larvae appear in maximum numbers, i.e. as a rule at a time when the first larvae which we detect are 7-10 days old. The next treatment is applied only when there is new danger of the spread of the larvae of the pest. The treatment must be organized in such a way that it could be completed in a given zone according to signals within 10-14 days.

#### ATTENTION!

Extermination of Colorado beetle is obligatory according to the law. Persons who neglect the measures against this pest are subject to penalties according to paragraph 192 of the penal law.

#### RAPE

Cabbage ceutorrhynchus (Ceutorrhynchus pleurostigma)	Gamaryl*	Incrustation	5 kg/q	Before sowing
	Gamacid	Disinfection of soil	70 kg	

\*In addition, 1 liter of ball-bearing oil. This applies especially to corn and sugar beet areas.

Four-dented and rape ceutorrhynchus (Ceutorrhynchus quadridens et napi)	Aerosol DL or	Aerosolization	6 lit.	According to signals, approximately at the end of March and at the beginning of April
	Gamadyn*	Dusting	20 kg	

It is recommended to use airplanes when the soil is soaking wet.

Rape weevil "Blyskacek repkovy" (Meligethes aeneus)	Aerosol DDT	Aerosolization	6 liters	According to signals
	or			
	Dynocid or Melipax	Dusting	20 kg	

We use Dynocid before the rape stops blossoming. When it stops blossoming we can use only Melipax, and the dusting with Melipax should be repeated 2-3 times.

Provisions of the announcement of the MZLVH No. 37/1963 of Sbirka should be observed.

Plant and harmful factor	Preparative	Treatment	Portion of prep. and water*) in lit./ha	Time of treat., signalization data	Date of last t. b. har. (days)**
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[ Rape wasp / "pilatka repkova" (Athalia rosae)	Aerosol DDT	Aerosolization	6 liters	When the insect is discovered	-
	or Dynocid	Dusting	20 kg		

When the insect occurs in smaller numbers, it is enough to treat the centers of concentration. The treatment is effective only when applied to the youngest development stage of the pest.

Cabbage aphid (Brevicoryne brassicae)	Intration or	Spray	0.4 liters	Before blossoming	21
	Intrasol 3	Aerosolization	6 lit.	According to signals at places of prognosis	21

Pod ceutorrhynchus (Ceutorrhynchus assimilis) Cabbage "bejdomorka" (Dasineura brassicae)	Melipax	Dusting	20 kg	When the pest attacks	30
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The dusting must be repeated 2-3 times.

MUSTARD					
[ Rape wasp / "pilatka repkova" (Athalia rosae)	Melipax	Dusting	20 kg	When the pest is discovered	30

POPPY					
helminthosporium (Helminthosporium papaveris)	Agronal	Soaking of seeds	5 g/kg	Before sowing	-

We use seeds from healthy crops. We do not sow poppy on land with heavy compact soil in closed and protected positions. We should eliminate the soil crust. After harvesting we should collect and burn the remnants of plants, and in the autumn we should plow the land at depth. Poppy should be sown on the same field after three years at the earliest. Soaked seeds must be marked distinctly. We soak all the seeds. If the soaked seeds are stored well, we can use the surplus of soaked seeds next year.

Plant and harmful factor	Preparative	Treatment	Portion of prep. and water*) data in lit./ha	Time of treat., signalization data	Date of last t. b. har. (days)**
Root stenocarus (Stenocarus fuliginosus)	Gamadyn or Aerosol DL or Lidykol	Dusting Aerosolization Spray	20 kg 6 lit. 1 kg	In the 4-leaves stage	-

We should take special care in treating the crops in areas where the pest appears regularly.

Poppy ceutorrhynchus (Ceutorrhynchus macula-alba)	Gamadyn or Aerosol DL	Dusting Aerosolization	20 kg 6 lit.	Before blossoming during the crocketing stage	-
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We treat all poppy areas in the first and second signalization zone, in the third zone only in those areas where the pest appears regularly.

#### FLAX

anthracnose septoria	Herma. L	Soaking of seeds	1 kg/q	Before sowing, can be soaked for storage	-
springtails (Halticinae)					

Anthracnose -- maintain an interval of 6-7 years when sowing flax in contaminated soil.

Septoria -- we must use seeds from nurseries attacked by septoria. Seeds originating from nurseries which are suspected of being infected with septoria require a test of their health condition by the UKZUZ. /Ústředni Kontrolni a Zkusebni Ustav Zemelsky -- Central Agricultural Control and Testing Institute/. We must remove careful all remnants of flax from the fields where this disease occurred, harrow the soil several times and treat immediately. The soil should be plowed as deeply as possible and sown with winter crops.

We soak all seeds. This treatment protects the crop against springtails and thrips only for 2-3 weeks after the plant has taken root. If the pests continue to appear, we must carry out an independent chemical treatment.

Springtails (Halticinae)	Dynocid or Aerosol DDT	Dusting Aerosolization	20 kg 6 lit.		-
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See note dealing with soaking.

Thrips (Thysanoptera)	Fosfotion	Spray	1.5 lit.	According to signalization	-
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Plant and harmful factor	Preparative	Treatment	Portion of prep. and water*) data in lit./ha	Time of treat., signalization data	Date of last b. har. (days)**
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Gamma moth (Plusia gamma) See page 17

Weeds (Dicotyledonous)	Dikotex 40	Spray	2 liters/600	When flax is 8-15 cm high	-
	Dinoseb	Spray	4.5-6 lit./800	When flax is 15 cm high	-

We spray Dikotex by using spraying equipment with flax sprayguns. When flax has been treated with Fosfotion against thrips, we must wait 5 days before we use Dikotex. Also, we should not spray Dikotex after rains when the wax layer has been washed from the leaves. We should use soft water whenever possible to dilute Dikotex.

Dinoseb is used primarily on areas containing weeds which resist Dikotex.

#### HEMP

Springtails (Halticinae)	Hermal L	Soaking of seeds	1 kg/q	Before sowing, can be soaked for storage	-
	Dynocid	Dusting	20 kg	When the pest is discovered	-

We soak all seeds. This treatment protects hemp against springtails 2-3 weeks from the time the plant takes root. If springtails appear again, we have to dust the plant with Dynocid.

#### ALFALFA, CLOVER

Fungous diseases	Hermal	Soaking of seeds	300 g/q	Before sowing, after first cutting, when the plant is (bruised ?)	-
	Kuprikol	Spray	6 kg/600		

As a preventive measure against fungous diseases, it is recommended to soak all seeds.

Kuprikol is used only for seed cultures or clover varieties.

#### Pea aphid

"msice-kyjatka hrachova" (Acyrthosiphon pisum)	Intration or	Spray	0.4 lit.	When discovered in places where the prognosis indicates large numbers	21
	Intrasol 3	Aerosolization	6 lit.		21

When it is impossible to treat the plants within the prescribed protective



Plant and harmful factor	Preparative	Treatment	Portion of prep. and water*) data in lit./ha	Time of treat., signalization data	Date of last t. b. har. (days)**
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period, the plants attacked by the pest should be cut and dried.

Cuscuta (Cuscuta spp.)	Rafex 35	Spray	30 kg/900	When it appears over an area, immediately after cutting, not later than within 5 days	
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Stubble-field should be properly raked, and the raked remnants should be eliminated after the harvest. The field can be harrowed only after treatment. When Cuscuta appears in concentrations, the contaminated clover should be cut and treated chemically. When the pest appears over an area, we spray the area twice in opposite directions, while maintaining the specified dose per hectare (30 kg).

Weeds	Rafex 35	Spray	9 kg/600	In the spring before bruising of the plants or after the first cutting	
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In seed-producing fields.

Alfalfa gall midges (Contarinia medicaginis)	Gamacid or Disinfection of soil	60 kg	In the second year at the beginning of vegetation, or after first cutting according to prognosis	
	Supergam	120 kg		

Alfalfa used for seed should be cultivated at higher windy locations with lower humidity of the soil. We should pay special attention to the treatment of those fields where the pest appeared during the first cutting. The first cutting of seed-producing fields and all cutting of alfalfa for use as fodder should be done at the end of the blossoming period at the latest. We recommend to plant seed cultures of alfalfa in rows at a minimum distance of 45 cm in field with light soil and low-level subsoil water. We should use heavy harrows in the spring and after the first cutting.

#### RED CLOVER

Minor broomrape (Orobancha minor)

Plant and harmful factor	Preparative	Treatment	Portion of prep. and water*) data in lit./ha	Time of treat., signalization last t. b. har. (days)**
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According to special directives of the MZLVH, see appendix on page 101.

Apions (Apion spp.)	Dykol or	Spray	1.6 kg	At time of maximum planting of cabbage heads (we treat only seed-producing areas)
	Aerosol DDT	Aerosolization	6 lit.	

All plants used for fodder should be cut during the first stage of blossoming (20% of blossoming heads at the most). Chemical treatment should be applied in particular in dry and warm areas, roughly to 5% of the areas cultivated for seed. The treatment must be completed before the blossoming of the plants, so that the bees would not be endangered.

CANNA				
(Canna Odontothrip)	Fosfotion	Spray	1.5 lit.	10-14 days after the first cutting, 14
"trasnenka stirovni- or				depending on the 21
kova" (Odontothrips	Intration	Spray	0.4 lit.	speed with which canna is (bruised?)
loti)				

We recommend that all seed-producing cultures be treated.

FODDER PLANTS				
(MEADOW)				
Grass moth	Soldep or	Spray	4 lit.	In springtime 14
(Characeae?				when caterpillars
graminis)	Wofatox	Spray	1 kg	are hatching 28
[apparently mis-spelled ("Characees", cf. trans.)]				

Basic agrotechnical measures should be maintained, such as harrowing and additional fertilization by nitrogen lime or potassium salt. We treat the plants during sunshine, when most of the caterpillars are on the surface and can be reached easily. When we cannot treat the plants immediately, we recommend that the concentrations of the appearance of the pest be isolated by belts covered with Gamadyn and at least 5 m wide, or by small ditches with vertical walls 15-20 cm deep and sprayed inside with Gamadyn. When we use preparatives based on DDT and Lindan (instead of Soldep or Wofatox), we need a permit from the MZLVH after an agreement has been reached with the chief hygienist.

Plant and harmful factor	Preparative	Treatment	Portion of prep. and water*) data in lit./ha	Time of treat., Date of signalization last t. b. har. (days)**
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#### SEED-PRODUCING GRASS

##### CULTURES

Hard rot ("Branic-natky") (Septoria spp.)	Sulikol or	Spray	3 kg/600	When the culture is sprouting -
Lunospora spp.	Sulikol K	Spray	3 kg/600	

Old grass should be carefully removed, and the removed substance should be burned or turned into compost.

##### Weeds

(Dicotyledonous)	Dikotex 40 or Agrion	Spray	2-3.5 lit./200-300	When the culture is 25-30 cm high -
		Spray	1-1.5 kg/200-300	

Treatment up to the beginning of sprouting.

##### HOPS

Peronospora (Pseudoperonospora humuli)	Kuprikol	1. Spray	15 kg/1500	When hops are 2-3 m high -
	Kuprikol	2. Spray	20 kg/2000	In the blossoms
	Kuprikol	3. Spray	25 kg/2500	At the beginning of the formation of cones
	Kuprikol	4. Spray	25 kg/2500	At the time of full formation of cones
	Novozir N 50 or Novozir N	5. Spray	12.5 kg/2500-3000	In the cones 7
	Niroxyd	Dusting	30 kg	7

We should remove weeds systematically from hop gardens and should never use subcultures. Ear-shaped sprouts (i.e. spring sprouts attacked secondarily by the oospores hibernating in the soil) should be removed and destroyed systematically during the vegetation period. Autumn cleaning in hop gardens should be done in time and the hop leaves should be cut and burned soon after harvesting. Barren hops and hops which have become sterile should be destroyed.

Each spray must be completed in 10 days. Spray frames can be used when hops are up to 4 m high and the consumption of the spray fluid is 3000 liters per 1 ha. We must not spray more than 2 rows on each side by spray

Plant and harmful factor	Preparative	Treatment	Portion of prep. and water*) data in lit./ha	Time of treat., signalization data	Date of last t. b. har. (days)**
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frames.

Niroxyd is used only as an emergency measure in hop gardens which are inaccessible to land-bound machines.

<b>Aphids</b>					
(Aphidoides)	Teration or	Pouring	1 ccm/100 ccm on 1 plant	After the introduction of hops before the first side-plowing	56
(Red spider mite) "eviluska"	Terra Sytam				56
(Tetranychus telarius)	Intration or	Spray	1.1 lit./1500-2500	According to signalization	21
	Intrasol 10 or	Aerosolization	6 lit.	Immediately before harvesting	21
	Phosdrin	Spray by airplane	1.2 kg/100		5

When the cribs of hops are wide, we use two doses for one bush of hops. In hop-growing areas we should pay greater attention to the winter treatment of trees bearing stone-fruit, particularly those in close proximity of hop gardens. We should always spray in the direction of the new wood. We use Intration or Intrasol 10 primarily all hop gardens where the cribs are wide, and all hop gardens which were not treated by poured disinfectant, especially in combination with sprays against peronospora. Phosdrin is designed to treat hops exclusively when aphids and red spider mites appear late in the year at the time when we cannot use other preparatives of the system.

Red spider mite (Tetranychus telarius)	Tedion	Spray	4 kg/2000	According to signalization	14
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Tedion (and Phosdrin) are used as a reserve in case red spider mites and aphids appear late in the season.

Springtail (Psylliodes attenuata)	Dynocid or	Dusting	20 kg	At the beginning of burgeoning	-
	Aerosol DDT	Aerosolization	6 lit.		

If the pest appears, hops should be treated immediately after the burgeoning of the shoots.

Plant and harmful factor	Preparative	Treatment	Portion of prep. and water*) data in lit./ha	Time of treat., signalization data	Date of last t. b. har. (days)**
"krisek" (Euscelinae)	Dykol or	Spray	8 kg/2000	When the pest appears in disastrous proportions	30
plant bug (Heteroptera)	Aerosol DDT	Aerosolization	6 lit.		

We should treat primarily the (female) hop gardens and those which are next to them in order to protect them against the carriers of viruses. Hop leaves treated with DDT preparatives must not be used as fodder.

Otiiorhynchidae weevils (Otiiorhynchus spp.)	Gamadyn or	Dusting	40 kg	When the pest appears in the springtime	-
	Aerosol DL	Aerosolization	6 lit.		-
Meadow "sedavka" (Hydraecia micacea)	Camaryl	Pouring	1000 ccm 0.1 % solution per 1 plant (=5 kg/ha)	During the budding of the first shoots	-

The hop gardens should be kept perfectly clean through the entire year and the weeds should be destroyed, primarily dog-grass. Treatment should be applied only to hop gardens which have been infected.

#### TOBACCO

peronospora (Peronospora tabacina)

When peronospora appears, it must be reported immediately to a plant doctor ("rostlinolekar") of the VZS or to an agronomist of the tobacco industry. Protective measures should be organized according to special instructions of the MZLVH.

Aphids (Aphidoidea)	Fosfotion	Spray	0.3%/450 lit.	2 weeks after planting in the field	-
Thrips (Thysanoptera)					
Wireworms (Elateridae)	Gamacid or Supergam	Disinfection of soil	100 kg 200 kg	Week before planting	-
(Agrotis) "osenic polni" (Agrotis segetum, etc.)					

Plant and harmful factor	Preparative	Treatment	Portion of prep. and water*) data in lit./ha	Time of treat., Date of signalization last t. b. har. (days)**)
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#### STALK VEGETABLES

"blinding" of cauliflower (lack of molybden)

Sodium molybdenate

Supplementary fertilization

1-2 kg;  
0.1 g/m<sup>2</sup>

During preparation of soil before planting

Spray

1 kg/1000

When first symptoms of disease appear on the leaves

Soil reaction should be adjusted as neutral to slightly alkaline. Do not use fertilizers which are physiologically acid. During packing it is recommended to add 2 g of sodium molybdenate per 1 m<sup>3</sup> of soil. Mix the preparative evenly with the soil. The dose of kg per 1 m<sup>2</sup> is designed for a hotbed. We select one of these methods, either for the hotbed or for the field. The blinding of cauliflower appears primarily in acid soil. In reproduction cultures molybdenate can be supplied in the form of pouring of 0.1% of the solution in doses of 50-100 ccm per plant.

Dropping of germinating plants	Hot steam or	Disinfection of soil		14 days to 1 month before sowing or planting	-
	Formalin 40%	Pouring	250 ccm in 10 lit. water/m <sup>2</sup>	3-4 weeks before sowing (planting)	-
	or Germisan	Pouring	20-25 g in 8-10 lit. water/m <sup>2</sup>	14 days before sowing	-
	Agronal	Dusting of soil	5-10 g/m	After sowing	-

Use well-ripened 4-year compost with vegetable remnants which are completely decomposed. Reduce humidity in the hotbed by limiting the addition of water and by ventilation, and do not sow the seeds too close together. Transfer seed boxes to a drier glasshouse where the humidity of the air is low. After sowing cover the surface of the soil with a fine layer of sand or charcoal or saturated ashes from coke. Apply disinfection by steam at the time when the soil is not frozen. Disinfection is effective against diseases, animal pests, and weeds. Germisan or Agronal is used to disinfect soil only in hotbeds in the case of vegetables assigned for transplanting. When we transplant the vegetables we must protect our hands by using rubber gloves.

Plant and harmful factor	Preparative	Treatment	Portion of prep. and water*) data in lit./ha	Time of treat., signalization data	Date of last t. b. har. (days)**
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Alternaria (or leaf spot) (Alternaria circinans, Alternaria brassicae)	Kuprikol or Novozir N 50	Spray	1%	1. Spray before blossoming	-
Cabbage peronospora (mildew) (Peronospora brassicae), gray mold (Botrytis cinerea), Black rot (Xanthomonas campestris) in reproduction cultures		Spray	0.5%	2. Spray after blossoming	

Add (adhesin) [word only partly visible, cf. trans.] to the preparative.

Pests, diseases weed seeds	Nematin	Pouring (disinfection of soil)	150 ccm/m <sup>2</sup> 5 lit./m <sup>2</sup>	According to instructions	-
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Four-toothed and rape ceutorrhynchus (Ceutorrhynchus quadridens et napi)	Gamadyn or Lidykol	1. Dusting Spray	7 g/m <sup>2</sup> 0.4%	After germination of plants in hot-bed, a week before planting	-
	Gamadyn or Lidykol	2. Dusting Spray	7 g/m <sup>2</sup> 0.4%	In the field when the pest is discovered	30
	Gamadyn or Lidykol	3. Dusting Spray	20 kg 1 kg		30

Do not cultivate stalk vegetables in close proximity to rape.

Cabbage ceutorrhynchus (Ceutorrhynchus pleurostigma)	Gamacid or Supergam	Disinfection of soil	100 kg 200 kg	Before sowing	-
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Introduce in shallow soil.

Springtails (Halticinae)	Dynocid or Aerosol DDT	Dusting Aerosolization	20 kg 6-9 lit.	When the pests begin to appear	30
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Plant and harmful factor	Preparative	Treatment	Portion of prep. and water*) data in lit./ha	Time of treat., signalization data	Date of last t. b. har. (days)**)
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Aerosol only during the early stage after transplanting, prior to the beginning of the formation of rosettes.

Cabbage aphid (Brevicoryne brassicae)	Fosfotion or Phosdrin or Intration	Spray	2 lit. 0.6 lit. 0.4 lit.	When the pest is discovered	14 7 60
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In reproduction cultures we use Intration in 2 sprays: first spray before blossoming, second spray after the end of blossoming. We must add adhesive to the preparative. We can use Intration only on winter cabbage. Use only Fosfotion or the preparative Nikotan to exterminate aphids in glasshouses. The protective period is 21 days in the case of Fosfotion and 10 days in the case of Nikotan.

Cabbage butterfly (Pieris brassicae)	Dykol or Dynocid or Phosdrin or Soldep	Spray Dusting Spray Spray	1.6 kg 25 kg 6.6 lit. 0.6 lit.	When it appears in harmful numbers	30 30 1 14
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Cabbage moth (Mamestra brassicae)	Dykol or Dynocid or Soldep	Spray Dusting Spray	1.6 kg 25 kg 0.6 lit.	When the pest begins to appear	30 30 14
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Cabbage fly (Chortophila brassicae)	Alvit 55 or Dieldrex B or Schering insectation means Gamacid or Supergam Gamadyn	Incrustation of seed Preparation of soil Dusting	0.05%/50ccm per plant 2.5 kg/m <sup>3</sup> 5 kg/m <sup>3</sup> 20 kg	Before sowing Before packing " " After planting, depending on the direction of the attack	- - -
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We mix Gamacid or Supergam with clay assigned for packing. We do not do the dusting on fields where the soil was prepared by Gamacid or Supergam.

Whitefly (Aleuro-Goidea)	Gamaryl	Pouring	10-20 ccm of solution per plant	0.1% At the first symptoms of attack	-
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Plant and harmful factor	Preparative	Treatment	Portion of prep. and water*)data in lit./ha	Time of treatment, signalization data	Date of last t. b. har. (days)**)
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We use 0.2% of Fosfotion against whiteflies. The period of protection is 21 days.

VEGETABLES SEEDS	Germisan or	Soaking	0.25% solu-	Before sowing	-
Fungous diseases		of seeds (wet)	tion		
	Hermal or	Soaking	According to		-
		of seeds (dry)	instructions		
	Agronal	Soaking	According to		-
		of seeds (dry)	instructions		

We soak the seeds 10-15 minutes in a solution of Germisan. Then we take them out and wash in clean water. Since we may damage the germinating capacity of certain types of vegetables which have been soaked in Germisan, it is recommended that we make a test first using a small amount of seeds.

CELERY	Germisan or	Soaking	0.25% solu-		-
Hard rot (Septoria apii graveolentis)		of seeds (wet)	tion		
	Agronal	Soaking	5 g/kg	According to	-
		of seeds (dry)		instructions	
	Brestan or	Spray	1.6 kg/600	When the disease	42
				has been discovered	
	Kuprikol	Spray	8 kg/600		7

We should use seeds from healthy seed cultures which have been treated chemically, or we should use seeds which are 3 years old. Remnants of the attacked herbage should be collected carefully after harvesting and put in compost. Celery should not be cultivated for 2 years in the same field. The cultures should be given a good supply of nitrogen fertilizers. The spraying has to be repeated after 14 days. In hotbeds celery is treated with 0.1% Brestan or 0.75% Kuprikol. Herbage from celery treated with Brestan may not be used for consumption.

Celery philophylla ("virtale celerova") (Philophylla heraclei)	Soldep	Spray	0.6 lit/600	When the larvae begin to hatch	14
Weeds	Gesagard (Prometryn)	Spray	1-3 kg	Before or after planting	-

Plant and harmful factor	Preparative	Treatment	Portion of prep. and water*) data in lit./ha	Time of treat., signalization data	Date of last t. b. har. (days)**
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We spray immediately before planting or after planting, when the celery has taken root and the weeds have sprouted. We should also spray before or at the beginning of the formation of the axial stems of the weed. It is more advantageous to do the spraying after the planting of celery and apply it to weeds which have already sprouted, because the herbicide is more effective and the culture remains without weeds for a longer period of time.

When we apply the herbicide on growing weed, we must treat plants when they are dry. The dose of 3 kg is used for heavier soils when they are dry.

#### ONION-LEEK

Mildew (peronospora)(Peronospora destructor)	Kuprikol + Adhesin	Spray	6 kg/600 starting in the second half of May	-
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We use 1% Kuprikol in reproduction cultures of onion. Cultures, primarily cultures of seed onions, should be located in such areas where there is good circulation of the air and the dew dries quickly. The longer side of the field should be oriented vertically to the predominant direction of the winds.

Seed onions are planted preferably in long narrow belts. Onions used for seed should not be cultivated next to the reproduction areas of onions and next to plants which grow high. Onion should not be fertilized with nitrogen. Remove and burn remnants of affected plants after harvesting. Treat the plants as needed up to the harvest time.

#### Botrytis disease (Botrytis Botrytis spp.)

Do not fertilize onions with nitrogen. It is preferable to add potassium and phosphorus. Harvest onions when they are completely ripe and the neck is dry. Dry well after harvesting through air circulation at temperatures of 37-48 °C. Store in dry storage rooms at temperature of 2-4°C and relative humidity up to 65°. Remove onions containing viruses from the field.

Onion fly (Hylemyia antiqua)	Alvit 55 or Incrustation of seed	50 g/kg + Before sowing 75 ccm of water	-
	Dieldrex B or Incrustation preparation Schering		

Plant and harmful factor	Preparative	Treatment	Portion of prep. and water*) data in lit./ha	Time of treat., signalization	Date of last t. b. har. (days)**)
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Gamadyn or	Dusting	20 kg	At the time when the fly begins to lay eggs	-
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Lidykol	Spray	1 kg		
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In the case of seedling onion we use the dose of 5 g per liter of water. We spread seedling onions on a sieve and soak them twice for 1 minute in the prepared broth. Stir the broth from time to time. This dose will be sufficient for about 3 kg of seedling onion.

In the case of Dieldrex B we must add the same amount of Adhesin to the preparative. Mix it and add water.

Onion ceutorrhynchus (Ceutorrhynchus suturalis)	Soldap	Spray	0.6 lit.	14
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Treatment should be repeated in 10-14 days.

Carriers of viruses ("Krisci", bugs, or aphids)	Gamadyn or Dykol or Lidykol or Intration	Dusting Spray Spray Spray	20 kg 1.6 kg 1 kg 0.4 lit.	First treatment Treatment when the presence of carriers of virus diseases has been discovered	30 30 30 35
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Make negative selections of macroscopically-attacked plants in cultures of seedlings and planting onions. Those plants which have been eliminated should be destroyed. When we cultivate onions for seedlings, female onions, and planting onions, we should maintain an isolation distance of 500 m from onions of older crops and from onions used for consumption. Treatment by Gamadyn is done in dry weather at intervals of 1 week, at intervals of 2-3 days when it rains. Treatment by Dykol or Lidykol at intervals of 14 days, depending on weather. Sow in rows more than 30 cm wide, so that it will be possible to use land machinery for spray. Intration is to be used only for seedling and planting onions. Treatment should be repeated at intervals of 12-14 days as a preventive measure. We can combine the treatment with the treatment against mildew.

Weeds (annual)	Prevenol concentration or Liro CIPC or Alisan	Spray	5-7.5 lit./After sowing 600	-
		Spray	12-16 kg/600	Before the weed takes root

Plant and harmful factor	Preparative	Treatment	Portion of prep. and water*) data in lit./ha	Time of treat., Date of signalization last t. b. har. (days)**
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Smaller doses of Prevenol should be used only in light soil. When we use herbicides we should not neglect to loosen the soil. This affects favorably the crops in terms of quantity and quality. However, we should not proceed with planting immediately after treatment. The best time to apply Prevenol in sowed cultures is 8-12 days after sowing in the case of the sowing of early crops, or 2-3 days after sowing of late crops. In the case of soil which is light and contains less humus, we must do the spraying as soon as the sprouting stage begins (after the onions take root). The sprouts must be greenish. Onion which has taken root can be treated in 2-3 days after rains, so that a wax layer can be formed on the leaves. This layer protects the onion against damage. The soil must be prepared carefully for sowing. The sowing should be done at slightly greater depth than normally. This reduces the danger that the culture may be damaged, primarily in soils which have smaller amounts of humus. When we sow at greater depth we must increase slightly the sowing norm. Crust formed before sprouting must be mechanically disturbed. Prevenol is still effective when the weeds are in the stage of cotyledonous leaves. Treatment given later is little effective. Seedlings are treated immediately after planting.

Weeds which resist the treatment: (common crossweed) "starcek obscny", (milk juice) "mlece", nettle, "petour malouborny", maritime camomile, etc. We can apply Alisan to sown cultures for the first time before they sprout, if the weeds have already taken root. Further spraying is done after the culture has taken root only when the stage of ("whip" ?) has been overcome. Seedlings are treated with Alisan at a time when the plants reach the height of 6 cm. Further spraying is done as needed, but mostly before the plants reach the height of 15-20 cm.

Plant and harmful factor	Preparative	Treatment	Portion of prep. and water*) in lit./ha	Time of treat., signalization data	Date of last t. b. har. (days)**)
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# **TOMATOES** **viruses**

Protection against aphids, elimination of plants showing clear symptoms of viruses. Do not smoke while handling the plants, keep hands clean.

Potato mildew (Phytophthora infestans)	Kuprikol or Spray	0.75%	Roughly from the middle of July, depending on primary occurrences	7
Septoria (Septoria lycopersici)	Novozir N 50 Spray	0.5%		7
Cladosporium fulvum				

Cladosporium fulvum attacks hothouse tomatoes, especially when relative humidity is high, and spreads as an epidemic when the relative humidity is over 80%. For that reason we have to ventilate a great deal. As a preventive measure we can spray tomatoes in the second half of vegetation. The fungicides should be applied several times within the interval of one week. When there is an epidemic of the fungi, we should burn infected material, disinfect it with formalin, and keep it closed for four days. In hothouses we treat fungous diseases by spraying the tomatoes with 1% Kuprikol or 0.5% Novozir N 50. The protective period in the case of Novozir is 14 days. We treat the tomatoes when the disease is discovered. Preventive measures are necessary during a year which is particularly humid. Use alternatively Kuprikol and Novozir. Until the reserves are exhausted, we can use Novozir N in double amounts.

Aphids (Aphidoidea)	Fosfotion Spray or Nikotan Spray	0.2% 0.4%	When the pest is discovered	21 10
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The protection period in the case of Fosfotion in hothouses is 28 days.

Whitefly (Aleurodoidea)	Fosfotion Spray	0.2%	When the pest is discovered	28
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Treatment applied only in hothouses. Repeat twice to three times, always at intervals of 10-14 days.

Plant and harmful factor	Preparative	Treatment	Portion of prep. and water*) data in lit./ha	Time of treat., signalization data	Date of last t. b. har. (days**)
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#### CUCUMBERS

bacterial spotting of leaves (Pseudomonas lachrymans)	Hermal L	Soaking of seeds	6 g/kg	Before sowing	-
cucumber scab (Cladosporium cucumerinum)					
anthracnose (Colletotrichum orbiculare)					
corynespora (Corynespora melonis)					
"kvetilka vsezrava" (Chortophila florilega)					

Cucumber scab: overall nutrition given to cucumbers in the form of artificial fertilizers reduces the chances of attack, one-sided fertilizing by means of farm manures increases the chances of attack. The temperature in hothouses should be maintained even, so that there would be no condensation or drops of water on the leaves and fruits. After the harvest of infected plants we should clean the hothouse and disinfect it by using a strong solution of soda. The soil should be changed. Do not cultivate the plants too close to each other.

bacterial spotting of leaves (Pseudomonas lachrymans)	Kuprikol	Spray	6 kg/600	When first symptoms are observed	7
cucumber scab (Cladosporium cucumerinum)					
Brown rot (Sclerotinia sclerotiorum)					

Brown rot: disinfection of soil. Remove infected plants and attacked fruits before brown rot appears. Maintain the principles of correct alternation of plants, do not use fresh composts.

#### viruses

Protection against aphids, elimination of plants with clear symptoms of viruses. Do not smoke while handling the plants, keep hands clean.

bacterial spotting of leaves	Novozir N 50	Spray	3 kg/600	When first symptoms are discovered	7
anthracnose					
corynespora					

Plant and harmful factor	Preparative	Treatment	Portion of prep. and water*) data in lit./ha	Time of treat., signalization	Date of last t. b. har. (days**)
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Anthracnose: tear off the first leaves which have been infected, or destroy centers of the disease.

Corynespora: limit watering, reduce temperature and air humidity by ventilation, but avoid sudden changes of temperature. Add fertilizers such as calcareous saltpeter, potassium sulphate, and phosphorous fertilizers which are dissolved easily. We repeat the treatment as needed.

erysiphe	Sulikol or	Spray	4.5 kg/600	When infection	7
(Erysiphe polyphaga)	Karathane	Spray	0.3 kg/600	appears, repeat when necessary (gherkins 21)	7

Prevent sudden variations of temperature in hotbeds and hothouses. Preventive care is necessary especially in areas with intensive cultivation of vegetables. Remember operational tracts in large-scale production of cucumbers. When we use spray in hothouses, we apply 0.75% concentration of Sulikol, 0.05% of Karathan.

red spider mite	Fosfotin or	Spray	1.5 lit.	When the pest	14
(Tetranychus telarius)	Phosdrin or	Spray	0.6 lit.	begins to	7
	Sulikol or	Spray	0.75%	appear	14
	Sulka	Spray	1%		14

We repeat treatment as needed.

Protective period in the case of Fosfotin for gherkins is 21 days. Phosdrin in areas which are not closed. Sulikol and Sulka only in hothouses.

aphids (Aphidoidea)	Phosdrin or	Spray	0.6 lit.		7
	Fosfotion or	Spray	1.5 lit.		14
	Nikotan	Spray	0.4%		10

We repeat treatment as needed. In the case of Fosfotion, the protective period is extended by one week for gherkins.

whitefly (Aleurodoidea)	Fosfotion	Spray	0.2%	When pest is discovered	14
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Treatment applied only in hothouses. Repeat treatment 2-3 times, always at intervals of 10-14 days.

Plant and harmful factor	Preparative	Treatment	Portion of prep. and water*) data in lit./ha	Time of treatment, signalization data	Date of last t. b. har. (days**)
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**IMPORTANT NOTE:**

We do not use preparatives based on DDT or HCH in the case of cucumbers, either during vegetation period to treat the plants or for soil disinfection. These preparatives damage the plant.

**GARLIC**

fungous diseases	Germisan or Soaking	0.25%	Before sowing	-
	Polybarit	of cloves 4%		
		of garlic		

Plant only healthy and undamaged cloves.

Cloves are soaked in a solution of Germisan  $\frac{1}{2}$  - 1 hour as a protection against fungous diseases. Garlic can be planted immediately in humid soil after soaking. In addition, we can let the cloves dry and plant them later on. Germisan can be used for treatment even after we have used Sulka. We recommend this combined treatment immediately before planting. Polybarit can be used only in autumn planting and in the case of plants without any buds.

carriers of viruses	same as in the case of onion
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(Ditylenchus dipsaci)	Sulka or Polybarit	Soaking of cloves	5% 4%	Before sowing	-
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In all cultures of garlic we make at least three negative selections of diseased (dwarfish, swollen) plants, even when they are still green. The first selection should be made as early as in the second half of May, the second in June, the third at the beginning of July. Destroy plants which have been eliminated. Do not plant garlic or any other onion-type plant at least for four to five years in fields where garlic was attacked by the pest.

We soak plants which are suspected of harboring the pest. We use a solution of Sulka for 6-12 hours. We use a solution of Polybarit only for autumn planting.

onion fly (Hylemyia antiqua)	Alvit 55 or Dieldrex B or incrustation, Schering preparative	Preparation of cloves	5 g/lit. of water 5 g/lit. of water	Before planting	-
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Plant and harmful factor	Preparative	Treatment	Portion of prep. and water*) in lit./ha	Time of treat., signalization data	Date of last t. b. har. (days**)
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Same as in the case of onion. Apply after soaking in Sulka.

weeds	Alisan or	Spray	12-16 kg	When garlic takes root and reaches a height of 5-10 cm	-
	Gesagard (Prometryn)	Spray	1-2 kg or	After planting, before garlic takes root	-
			1.5- 3 kg	When garlic has taken root and reached the height of 5-10 cm	-

Do not forget to loosen the soil. Do not handle immediately after application of both preparatives. Use smaller dose of Prometryn for light soils.

#### MELONS

anthracnose (Colletotrichum orbiculare)	Hermal	Soaking of seeds	6 g/kg	Before sowing	-
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CARROT - PARSLEY fungous diseases	Hermal	Soaking of seeds	6 g/kg	Before sowing	-
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spotted parsley (Septoria petroselinii)	Kuprikol or	Spray	1%	First spray b. blossoming	-
	Novozir N 50	Spray	0.5%	Second spray after blossoming	-

spotted carrot - black rot (Stemphylium radicum)

Do not damage the roots of planting carrots during the harvest, grade the carrots and store only the healthy roots.

Plant and harmful factor	Preparative	Treat., ment	Portion of prep. and water*) in lit./ha	Time of treat., signalization data	Date of last t. b. har. (days**)
carrot mildew (Plasmopara nivea)	Sulka	Spray	1%	When the disease, appears, after blossoming	-
oidia (Erysiphe polygoni)					
carrot "merule" (Trioza viridula)	Fosfotion	Spray	1.5 lit.	At the first sign of curling	14
weeds in carrot field	Prevenol concentrate (Liro CIPC) or	Spray	7.5-10 lit./600	After sowing, b. the plant takes root, not later than in the stage of cotyledonous leaves	-
	Gesagard (Prometryn)	Spray	1-3 kg	After sowing, b. the plant takes root	

Inter-row cultivation, same way as in the application of Prevenol to onion. For resistant weeds, see note in the paragraph on onion, page 38. The lower dose recommended with regard to Prometryn is used on lighter soils.

#### weeds in parsley

Same protective measures as in the case of weeds in carrot fields. Use spray on soils which lack humus and on light soils at the time when parsley has cotyledonous leaves.

#### CARAWAY SEEDS

caraway "makadlovka" (Depressaria nervosa)	Lidykol or Gamadyn or Aerosol DDT	Spray	1 kg	In April, when the small butterflies appear	30
		Dusting	50 kg		30
		Aerosol-ization	6 lit.		30

Plant and harmful factor	Preparative	Treatment	Portion of prep. and water*) data in lit./ha	Time of treat., signalization	Date of last t. b. har. (days)**)
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#### LETTUCE

lettuce mildew (Bremia lactucae)	Kuprikol or Novozir N 50 Spray	Spray	6 kg/800 4 kg/800	At a time when lettuce begin to shoot from the lettuce heads	-
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Only in the case of reproduction cultures.

spotted fungous diseases (Marssonina panattoniana, Bremia lactucae, Septoria lactucae)	Kuprikol	Spray	1%	First spray when 3-4 true leaves appear, then after a period of 14 days, later according to needs	-
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Only in the case of reproduction cultures.

Lettuce moth (Tortricidae) ("obalec locikovy") (Semasia conterminana)	Melipax	Dusting	20 kg	First spray immediately b. blossoming, afterwards according to needs	-
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Only in the case of reproduction cultures.

aphids (Aphidoidea)	Phosdrin	Spray	600 ccm/600 lit. of water/ha	A week before harvesting	7
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slugs (Limacidae)	Limacid	Scattering small amounts	According to instructions	As the slugs appear	-
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We can also use Limacid for other vegetables. We apply it between the rows.

RADDISH					
white mould (Albugo candida)	Kuprikol or Novozir N 50 Spray	Spray	1%	First spray b. blossoming	-
cabbage mould (Peronospora brassicae)	Novozir N 50 Spray	Spray	0.5%	Second spray after blossoming	

Plant and harmful factor	Preparative	Treatment	Portion of prep. and water*) data in lit./ha	Time of treat., signalization data	Date of last t. b. har. (days*)
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Use only on reproduction cultures.

<b>SPINACH</b>					
(sugar beet fly)	Soldep	Spray	0.6 lit./300	At the time of maximum hatching of larvae	14
"kvetilka repna" (Pegomya hyoscyami)					

poppy aphid (Doralis fabae)	Intration	Spray	0.4 lit./300	Same time as in the case of technical /crops ?/	-
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Use only on reproduction cultures

weeds	Alipur	Spray	3 lit./500	Within three days after sowing	-
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Soil must be prepared carefully for sowing, it must be without clods. The sowing should be done at greater depth than normally. In dry weather and at temperatures above 18° C the chemical is weak and therefore such a treatment would be purposeless. The chemical is less effective in soils with high content of humus. In sandy soils which do not have any humus there is greater danger that we may damage the culture.

<b>STRAWBERRIES</b>					
grey mould (Botrytis cinerea)	Heryl or	Spray	1.5 kg	Once in the blossom	-
	Novozir N 50	Spray	4 kg	Once immediately after the end of blossoming	

strawberry mite (Tasonemus fragariae)	Gamaryl or	Spray	0.2%/2000	Three sprays at seven-day intervals after harvest	-
	Diazinon or	Spray	0.4%/2000	Before blossoming	-
	Endrin	Spray	0.1%/2000	In the autumn in the case of (seedling) cultures	-

Plant and harmful factor	Preparative	Treatment	Portion of prep. and water*) in lit./ha	Time of treat., signalization data	Date of last t. b. har. (days)**
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Planting strawberries used for new fields should be taken only from uncontaminated cultures. All reproduction areas and contaminated areas are treated by hand sprayguns (under high pressure).

Endrin should be used only once on (seedling) strawberry fields.

strawberry weevil (Anthonomus rubi)	Melipax	Dusting	20 kg	When first buds are damaged	30
strawberry worm (nematode) (Anthonomus rubi)	Intration	Spray or	0.3%	After harvest, second spray 10 days later	-
	Wofatox	Spray concentrate	0.1%	Repeat twice	-

In reproduction cultures when the pest has been discovered. Planting strawberries from reproduction cultures in the first year.

#### GRAPEVINES

peronospora (Plasma- para viticola)	Novozir 1.Spray N 50	3 kg + 2 kg/600	When the one-year shoots are 25-30 cm long	-
	+ Sulikol (Sulikol K)			
	Novozir 2.Spray N 50	5 kg + 4 kg/800	Before blossoming	-
	+ Sulikol (Sulikol K)			
	Kuprikol or 3.Spray	10/1200	Immediately after the end of blossoming	
	Bordeaux broth	12.5 kg/1200		
	Kuprikol or 4.Spray	20 kg/2000	When there is danger again	-
	Bordeaux broth	25 kg/2000		
	or Niroxyd	Dusting 30 kg		7

As a preventive measure applied to the entire vineyard. When peronospora appears in larger numbers, we should use Bordeaux broth in 1-1.5% concentration for the third and fourth spray (1 kg of Kuprikol corresponds to 1.25 kg of blue vitriol). Dusting by Niroxyd can be used to protect golden grapes. We can also use imported preparatives Kupritox and Vitigran against peronospora. In those places where oidia appear regularly, we should take preventive action and combine copper preparatives with Sulikol or Sulikol K in

Plant and harmful factor	Preparative	Treatment	Portion of prep. and water*) data in lit./ha	Time of treat., signalization data	Date of last t. b. har. (days**)
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0.75% concentration. We can also use imported preparative Thiovit according to instructions to spray oidia. Until the reserves are exhausted we can use Novozir N in double doses.

oidia (Oidium tucheri)	Sphinx sulphur	Dusting	20 kg	When the pest is discovered after blossoming	
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acaridiosis (Acarinosa)	Polybarit or	Spray	3-5%	After spring cutting, b. burgeoning	
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erinoze	Sulka	Spray	4-5%		
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We recommend thorough treatment of the entire vineyard.

red spider mite (Tetranychidae)	Sulikol (Sulikol K)	Spray	6 kg/1200		7
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When we use combined spray of Novozir N 50 with Sulikol, it is not necessary as a rule to apply the spray independently against red spider mites.

tortricidae (Tortricidae)	Dykol or Soldep	Spray	3 kg 5 lit./1200	Before blossoming - In the second half 14 of July	
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Depending on when the pest appears, we recommend two treatments: one before blossoming, second in the second half of July. The first treatment can be combined against peronospora with Kuprikol or Novozir N 50.

weeds	Hungazin DT (Simazin)	Spray	7-10 kg/1000	In the spring immediately after plowing and first stirring of soil	-
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We use Hungazin DT (Simazin) in doses of 7 kg on light, sandy, and gravel soils, and in doses of 7-10 kg/ha on heavier soils, depending on the predominant types of weeds. When we use Hungazin DT (Simazin), we can reduce the number of cultivation measures. In the following years we must the dose of 3 kg/ha on the treated areas. Doses of 7 to 10 kg/ha can be used only on vineyards which are more than four years old.

Plant and harmful factor	Preparative	Treatment	Portion of prep. and water*) data in lit./ha	Time of treat., signalization	Date of last t. b. har. (days)**
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DECORATIVE PLANTS  
IN HOTHOUSES AND  
IN THE OPEN AIR

falling of germinating plants

Same as in the case of stalk vegetables, see page 32.

fungous diseases on plants above ground	Novozir N 50	Spray	0.5%	Preventive treatment, or at first symptoms of the disease	21
	or Sulka	Spray	0.5-1%		
	or Polybarit	Spray	0.75-1%		
	or Sulikol	Spray	0.5-0.75%		
	(Sulikol K)				

We give preference to sulphurous preparatives in the case of fungi of the oidia group. Novozir is used against rusts. The effectiveness of sulphurous preparatives is greater at higher temperatures. At temperatures above 25° C the preparatives may become phytotoxic. In hothouses we can reduce the spreading of fungous diseases by abundant ventilation and by reducing air humidity. Instead of Novozir N 50 we can use double doses of Novozir N until the supplies are exhausted.

red spider mites (Tetranychidae)	Fosfotion or	Spray	0.3%	When the pest appears	14
	Intration or	Spray	0.04%		
	Polybarit or	Spray	1%		21
	Sulka	Spray	1%		

aphids (Aphidoidea)	Fosfotion or	Spray	0.2-0.3%	When the pest appears	14
	Intration	Spray	0.04%		21

An excellent preparative against aphids is also Dymogam or Lindafum. Intration should be used primarily on plants which are in the stage of intensive growth. This preparative can also be used in the form of pouring. The following plants are sensitive to systemic preparatives: Anthurium,

Plant and harmful factor	Preparative	Treatment	Portion of prep. and water** in lit./ha	Time of treat., signalization data	Date of last t. b. har. (days)**
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Ipomea, Dianthus, and certain variations of Chrysanthemums. Fosfotion could cause damage when applied to ferns, petunias, crassulaceae, and anthuriums.

maggots exuding wax and called "Vlnatky" (Pseudococcoidea)	Intration Spray	0.08%	When the pest appears	21
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maggots (Coccoidea) scales (Diaspididae)	Fosfotion Spray	0.3-0.4%	When the pest appears	14
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Treatment must be repeated in intervals of 1-2 weeks.

whitefly (Aleyrodidae)	Fosfotion Spray	0.3%	When the pest appears	14
thrips (Thysanoptera)				
cicadae (Cicadoidea)				

Kalanchoe does not withstand preparatives based on DDT.

bugs (Heteroptera)	Gamadyn or Dynol or organic phosphates (see cochineal insect)	Dusting Spray	2 g/m <sup>2</sup> 1%	When the pest appears	-
	Lindafum	Fumigation	1 tablet/ 10 m <sup>3</sup>		-

If necessary repeat treatment after 6-8 days.  
Lindafum should be used only on dry plants at temperatures below 25° C.  
Time of action 6-12 hours. Roses and hydrangeas do not tolerate it well.

sawflies (Tenthredinidae)	Soldep or Diazinon is most effective while pest is still young	Spray	0.2%		14
Treatment		Spray	0.2%		14



Plant and harmful factor	Preparative	Treatment	Portion of prep. and in l./ha	Time of treat., signalization or*) data	Date of last t. b. har. (days)**
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Aphelenchus nematode ("hadatka")	Metasystox	Spray	0.1%	When the pest appears	21
(Aphelenchoides Ditylenchus)	Nematin	Disinfect soil	150 ccm/m <sup>2</sup>		-

Repeat treatment in two-week intervals. With some plants preventively as f.i. Gloxonias, Chrysanthemums, Begonias (Lorraine variety). The correct amount of Nematin should be diluted in 5 liters of water and the soil watered with the solution.

springtails (Halticinae)	Dynocid	Dust	20 kg	When the pest appears	-
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Especially with some annuals such as nasturtium and stocks

wireworms (Elateridae)	Gamacid or Supergam	Disinfestation of soil	20 kg	Before sowing or planting	-
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(Limacidae) Slugs	Limacid				
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Same as for lettuce (see page 45 of original, [page 41 of translation])

#### GLADIOLUS

bacterial and fungous diseases	Germisan	Soaking	0.25%	Before planting
	Novozir N50	Spray	0.5%	
	- Adh...		0.2%	

Dry the bulbs immediately after digging them out at a temperature of 28-30°C, clean promptly.

Bacterium marginatum: during vegetation remove and destroy all diseased plants, dig out the bulbs early, do not take propagation material from diseased bulbs, destroy stems and leaves after harvest, store the bulbs in a dry place with good ventilation.

Rotate plantings, peel off dry skins from bulbs before planting, cut out diseased spots, discard heavily damaged bulbs. After the cut surfaces have healed macerate bulbs.

Unpeeled bulbs are macerated for 3 hours, peeled one hour. The bulbs can be macerated for 24 hours. The bulbs can be planted right away or one can wait for them to dry.

Instead of Novozir N 50, Novozir N can be utilized in double strength until all stocks are used up.

Plant and harmful factor	Preparative	Treatment	Portion of prep. and water*) data in lit./ha	Time of treat., signalization	Date of last t. b. har. (days)**
thrips (Thysanoptera)	Gamadyn or Dynocid or Dykol or Fosfotion	Dust Dust Spray Spray	20 kg 20 kg 0.4% 0.3%	During vegeta- tion	-   14

Bulbs are dusted in storage.

Repeat treatment in 6-8 day intervals

weeds	Dikotex 40 or Agrion or Prevenol concentra- tion or Rafex 35	Spray  Spray  Spray  Spray	3-4 kg/400 to 1,000 1-2 kg/400 to 1,000 7.5-10 lit/600  6-9 kg/800	See Note	-
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Also applicable to gladioli from bulbils - for these best results obtained before they sprout. Weeds are best destroyed by Dikotex or Agrion at the stage when they have 3-5 leaves. Prevenol is applied after the bulbs and bulbils have been planted, when weeds sprout, not on growing weeds or when the bulbs sprout. It is used in places where there are weeds resisting herbicides applied during vegetation such as chicken weed etc.

#### TULIPS

tulip botrytis  
(Botrytis tulipae) and other  
fungous diseases

Germisan	Soaking of bulbs	0.25-0.5%	1-2 hours before planting	-
Novozir N 50	Spray	0.5%	As a pre- ventive	-
+ Adhesin		0.2%	measure or at first symp- toms of disease	

Botrytis tulipae: it is necessary to carry out a strict negative selection of all the infected plants. It is necessary to remove the plants together with the bulbs, to burn them, or to bury them deep (in pits with unslaked lime).

Plant and harmful factor	Preparative	Treatment	Portion of prep. and water*) data in lit./ha	Time of treat., signalization	Date of last t. b. har. (days)**)
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Remove from the growth the plants and also the leaves which had been damaged by frost, hail, or wind; the head of the plant is to be cut off shortly after the end of the flowering.

Examine the bulbs carefully before planting them and remove all spotted ones and all the sclerotia. Alternate the plants; do not refertilize with nitrogen; plant the bulbs sparsely; remove the weeds; separate the tulips from the lilies of the valley in different areas of the greenhouse and do not water the leaves of the plants.

Sprayings are carried out several times during the vegetation period, depending on the weather. There should be at least three sprayings: in the spring, before blossoming and after blossoming. At the same time, one should also spray with Intration against aphids.

In place of Novozir N 50, it is possible to use up Novozir N, which is on hand, in double dosage.

aphids in the tips (Aphidoidea)	Lindafum	Fumigation	According to directions	-
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weeds	Prevenol	Spray	7.5-10/600	-
	concentration			

Apply in the spring, when the plants are 3-7 cm tall, while the tulips are still closed at the tips.

ROSES weeds	Hungazin DT (Simazin)	Spray	5-10 kg	In the spring before the sprouting of the weeds	-
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In plantings which are at least 3 years old. Against persistent weeds use the maximum dosage which is recommended.

FIELD MOUSE (Microtus arvalis)	Poisoned grain	Bait	See Note	In the spring or in the fall when damage is noted	-
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Plant and harmful factor	Preparative	Treatment	Portion of prep. and water*) data in lit./ha	Time of treat., signalization data	Date of last t. b. har. (days)**
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	Endrin	Spray	0.5 kg/450	In case of heavy infestation	60
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Germinating oat seeds are well mixed with eating oil in a soaking drum and then with zinc phosphide. Use 2 kg of oil and 2-7 kg of zinc phosphide for each 100 kg of grains. In order to prevent the poisoning of poultry or birds, the poisoned grains are placed, in 5-15 place piles, into the burrows of the rodents.

The application of Endrin is to be carried out according to the directives of the MZLVH [Ministry of Agriculture, Forestry and Water Management] (see page 97 of original).

#### SNAILS

(Limacidae)  
as in the case  
of lettuce,  
see page 45 of  
original[or  
page 41 of  
translation]

#### DECIDUOUS TREES OTHER THAN FRUIT TREES

cockchafers	Cyklo or	Dusting	50 kg	-
(Meloiontha spp.)	Gamacid, or	Dusting	50 kg	As indicated -
bugs (imagoes)	Aerosol HCH	Aerosol spray	6 lit.	-

In orchards the cock-<sup>chafers</sup> and bugs are shaken off the trees and destroyed mechanically.

Edges of deciduous forests are treated at the time of swarming.

grubs (larvae)	Gamacid, or Disin- Supergam	festation of soil	100 kg 200 kg	In the fall, as soon as possible after harvest of crops, etc.
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Plant and harmful factor	Preparative	Treatment	Portion of prep. and water*)data	Time of treat., signalization	Date of last t. b. har. (days)**)
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Treatment applied to areas where there has been heavy swarming of cockchafer in the spring, particularly on land where hoed plants or fodder plants were grown, within a maximum radius of 2 km from the place of swarming.

#### DOG'S GRASS ON PLOWED LAND

(Agrophrum repens)	Agropyr	Spray	35-50 kg of effective substance/600-900 lit.	In the fall immediately after shallow plowing or deep plowing	-
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Only on areas where the infestation is particularly strong. Cereals must not be grown in the treated soil in the following year. The subsequent crops can be sugar beet, fodder beet, potatoes, flax, corn, and sunflower - but not seed potatoes or seed beets. If flax is to be grown in the following year, the dose of the preparative should not exceed 35 kg.

#### NONAGRICULTURAL SOIL weeds

Travex, or Chlorotox, or Hungazin DT (Simazin)	Irrigation	40 g/lit/m <sup>2</sup> 5%/lit/m <sup>2</sup> 1 g/lit/m <sup>2</sup>	In May	-
	Irrigation		Best in the spring, when the weeds are sprouting	

Mechanical destruction. Apply the preparatives after rain. Use Simazin on frequented places.

\*) The amount of water given in liters is the required minimum amount. It can be increased depending on the type of equipment we use.

\*\*) The deadline for the last treatment - the safety time-limit - is the period between the last treatment of the crops or products and their harvest. This time-limit must be observed with regard to those crops or products which are to be used for human consumption or as fodder, so that we can make sure that they are harmless. When no deadline is indicated for the treatment, the preparative does not require such cautious handling, or the crops and products are treated during a season or against a noxious factor under circumstances which by themselves provide an adequate safety time-limit before the harvest.

# CALENDAR OF ALL-YEAR PROTECTION OF FRUIT TREES BY CHEMICALS

## Fight Against Pests and Diseases

### Winter Spray

Type	Preparative	Concentration	Remark
All fruit trees	Nitrosan or	1%	Against pernicious aspidiotus (Aspidiotus perniciosus) (San Jose scale) we use 2% Nitrosan or 5% Arborol Use Arborol AC only on trees which are strongly infested with eggs of red spider mite
	Arborol or	3%	
	Arborol AC	3%	

### Sprays During Vegetation Period

Type	Period	Preparative	Concentration	Safety Time-Limit	Remark
Peach trees	During budding June-July 2-4x	Polybarit	3.00%	7	Against fungous leaf curl
		Sulikol	0.50%		Against scabs and oidia
Kernel fruit trees	During budding	Polybarit	3.00%		Only on pear trees against leaf mites
		or Sulka	4.00%		
	After budding	Polybarit	1.00%		Against scabs and oidia. When there is danger of attack by [bloom worm] ("kvetopas"), we spray the trees after budding with a combination of 0.4% Dykol + 0.5% Sulikol.
		or Sulka	1.00%		
	Immediately before blossoming	Polybarit	1.00%		Against scabs and oidia.
	Immediately after blossoming	Novozir N50 + Fosfotion or + Intra-tion	0.60% 0.30% 0.04%		Against scabs, red spider mites, and [Athalia wasp] ("pilatka")

Type	Period	Preparative	Con- centra- tion	Safety Time- Limit	Remark
	10 days later	Novozir N50 + Sulikol	0.60% 0.40%		Only when scabs pre- sent a great danger.
	About 4 weeks after blossoming, depending on signalization	Dykol + Fosfotion	0.40% 0.30%	30	First spray against worms. When scabs present continued danger, we add 0.6% of Novozir N50 or 0.4% Sulikol.
	14 days later	Dykol + Fosfotion	0.40% 0.30%	30	Second spray against worms.
	During the second half of July	Dykol + Arafofo- tion	0.40% 0.30%	30	Third spray against worms. When scabs present a danger, we add 0.(rest of figure not visible, cf. trans.)% of Novozir N50 or 0.4% of Sulikol.

Plum trees	Immediately after blos- soming	Dykol + Fosfotion or Soldep or Intra- tion	0.40% 0.30% 0.20% 0.04%		Against wasps ("pilatky") and red spider mites.
	About 4 weeks after blossoming	Dykol + Fosfotion or Ara- fosfotion or Intra- tion	0.40% 0.30% 0.30% 0.04%	30 21 60	Against tortricidae and red spider mites.
	During the second half of July	Dykol + Arafos- fotion	0.40% 0.30%	30	Against tortricidae and red spider mites.

Cherry trees	About 4 weeks be- fore har- vest	DDT warm aerosol		30	Against [cherry fruit fly] "vrtule tresno- va" (cherry fruitworm)
	10 days before har- vest	Soldep	0.20%	7	Treatment by S-050/1 machine against cherry fruit fly.

When necessary, fruit trees are treated during vegetation period against the following:

-- Against leaf lice (aphids), [bloody louse] ("msice krvava"), pear thrips: Fosfotion 0.3%.

-- Voracious pests (caterpillars, chafers): Dykol 0.4% + Fosfotion 0.3%.

-- Red spider mites: Tedion V-18 0.1%, Arafosfotion 0.3%. We can also use Fosfotion 0.3%, but we have to repeat the spray in 10-14 days. Until the end of June we can also use Intration 0.04%.

-- Oidia (powdery mildew): Polybarit 1% or Sulka 1% or Sulikol 0.4-0.5%.

When we treat kernel fruit trees, we should look out for varieties which are sensitive to sulphur. Gooseberry does not stand sulphurous preparatives practically at all.

-- Certain other fungous diseases: 0.6% Novozir N 50.

#### Survey of Certain Varieties of Kernel Fruit Trees Which are Sensitive to Sulphurous Preparatives

Apple trees: Berlepsch, Cox, Graham, Jonathan, Groncel, James Grieve, Jesenicka, Oldenburg, White Kalvil, etc.

Pear tree: Lucas, Bosc, Parisian, Williams, etc.

Note: We do not spray during strong sunshine or in sultry weather. If we use mixtures of preparatives, we do not mix them in a concentrated form. We dilute the preparatives first separately in small amounts of water, then mix them together and add water to obtain the prescribed concentration. Until the supply is exhausted, we can use 1% Novozir N instead of 0.6% Novozir N 50.

#### Extermination of Weeds

Type	Period	Preparative	Portion of preparative and water in lit./ha	Remark
<u>Kernel fruit trees</u> <u>weeds</u>	In the spring before budding of leaves on trees and before weeds take root	Simazin or be-Hungazin DT	5-10 kg per 400-1000	Do not treat earlier than in the second year after planting. Against annual weeds it is enough to use a dose of 5 kg/ha, against perennial weeds (dog grass, etc.) we need 10 kg per hectar.



Type	Period	Preparative	Portion of preparative and water in lit./ha	Remark
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Stone fruit  
trees

(plum, cherry, apricot, peach trees)	In the spring before budding of leaves on trees and before weeds take root	Simazin or Hungazin DT	5 kg per 400-1000	Do not treat earlier than in the second year after planting.
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In cultures where we grow secondary crops or plants for green manure, we can spray only the zones in those rows of trees which cannot be treated mechanically. However, the recommended doses of the preparative must be recomputed to correspond to the actual treated area.

Red current

Weeds	In the spring before budding of current and before the weeds take root	Simazin or Hungazin OO	5-10 kg per 400-1000	On plants at least 3 years old. For annual weeds the dose of 5 kg/ha is adequate
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Raspberries,  
blackberries

Weeds	In the spring before their budding and before the weeds take root	Simazin or Hungazin OO	5-7 kg per 400-1000	On plants which are at least 3 years old. Doses of 7 kg per hectare should be used only on heavy soils.
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Protection of Fruit-Tree and Grapevine Nurseries

Winter spray of fruit-tree nurseries	Nitrosan or Arborol Arborol AC	1.00% 3.00% 3.00%	Arborol AC is used only when the trees are infested with winter eggs of red spider mites
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Type	Period	Preparative	Portion of preparative and water in lit./ha	Remark
Sprays of fruit-tree nurseries during vege- tation per- iod				
Peach trees	During budding	Polybarit	3.00%	Against fungous curls.
	In the sixth and seventh months	Novozir N50 + Sulikol	0.60% 0.50%	Against oidia and puncturation of leaves.
Kernel-fruit trees	During budding	Polybarit	3.00%	Only on pear trees against mites.
	During May	Intration + Sulikol	0.04% 0.50%	Against red spider mites, scabs, and oidia.
	In the sixth and seventh months	Intration + Dykol + Sulikol	0.04% 0.40% 0.40%	Against red spider mites, voracious pests, and fungous diseases.
Plum trees	During May	Intration	0.04%	Against mites and red spider mites
	In the sixth and seventh months	Intration + Dykol + Sulikol	0.04% 0.40% 0.40%	Against red spider mites, voracious pests, and fungous diseases.
Cherry trees and morello trees	During May, then in the sixth and seventh months	Intration + Dykol + Novozir N 50	0.04% 0.40% 0.60%	Against red spider mites, wasp ("Pilat- ka"), and punctura- tion of leaves
Walnut trees	At the end of the 5th and the begin- ning of the 6th months, repeat after 14 days	Kuprikol	1.00%	Against anthracnose

Type	Period	Preparative	Portion of preparative and water in lit./ha	Remark
Kernel- fruit trees Weeds	In the spring after 1st cultivation	Simazin or Hungazin DT	5 kg per 400-1000	Do not use until the second year after planting in the nur- series (innoculated stock). When we treat stone-fruit trees, we must spray them before the leaves begin to bud, so that we would not damage them.
Stone-fruit trees Weeds	In the spring after 1st cultivation	Simazin or Hungazin DT	3 kg per 400-1000	When the nursery is abolished, we must cul- tivate only resistant plants: corn, potatoes, vetch, and peas.
Grapevine nurseries	Every week from the beginning of the 6th month until the end of the 9th month	Novozir N 50	0.60%	Against peronospora. We can add 0.5% Sulikol against oidia, 0.3% fosfotion against red spider mite, when needed.

[Page 60 unavailable except for a fraction. It contains a small chapter dealing with "noxious remnants" and the beginning of a chapter dealing with toxic substances, cf. trans.]

...in case of accidental poisoning and depending on the method of soaking of the preparatives. Other persons handling such preparatives must be instructed regularly about the nature of the danger and how to handle the material correctly. When they handle poisons, they must be specially trained for the work and must take a test.

#### Review of Safety Time-Limits for Fruits and Vegetables

Preparative	Safety Time- Limit (Days)	Remarks
DDT /7 partly legible cf. trans.]	30	Only as a dust spray or suspension. Emulsion preparatives must not be used for vegetables and fruits. Aerosols can be used only to a limited extent.
...ndan (gama -- HCH)	30	
Fosfotion and Arafosfotion	14	For treatment of leaf and stalk vegetables and salad cucumbers.
	21	For treatment of pulp vegetables and fruits, hothouse leaf and stalk vegetables.
	28	Hothouse pulp vegetables.
Soldep	14	
	7	Cherry trees.
Aerosol DTHP	3	
Phosdrin	7	
Intration	60	Fruits and winter cabbage.
	35	Planting or seedling onion.
Nikotan	10	
Karthane	7	Salad cucumber.
	21	Gerkins and fruits.
Tedion V-18	21	
	14	Salad cucumber.
Novozir N	7	
	14	In hothouses.
Brestan	42	Only in case of celery septoria. The leaf tops must not be consumed.
Sulka	21	
Sulikol, Thiovit, Sulphur	7	
(Sfinx)/illegible, cf. trans.]	14	Hothouse vegetables.
Niroxyd, Kuprikol, and other preparatives con- taining copper	14	Hothouse vegetables.

2. Storage of preparatives. -- We can store and place in circulation...  
[page 62 and on unavailable].

Group No.	Name of Preparative, Application Form	Active substance, content in %	Classification According to Regulations Concerning Poisons, Ways of Entry, Harmfulness to bees	Safety Measures	Symptoms of Poisoning	Special Provision for First Aid and Remark
1.	Preparatives for protection of seeds for sowing and seeds.					
a)	Universal mordants of seeds for sowing and seeds.					
	Agronal M, P	fenylmercuri-bromide 4.5	poison, D.Z.P. V: -- [for explanation of these abbreviations, see p. 86 of the original or p. 77 in the translation, cf. cover, anti-trans.]	Dry mordants: In case of mercuric dustproof overall, scarf chronic poisoning on the neck, ring: headaches, rubber gloves dizziness, irrigation with textile tability, mental disturbances, trembling of hands, sleeplessness. Skin of goggles, dust-hands becomes proof respira- insensitive tor.	When we use Agronal for dusting to disinfect the soil (only in hot-beds of vegetable assigned for transplanting), we must protect ourselves by using rubber gloves when we transplant seedlings which have been treated in this manner.	
	Agronal H M	fenylmercuri-bromide 4.5 hexachlorbenzene 10 methylmercuridi- cyanamide 2	poison D.Z.P. irritates V:-- poison D.Z.P. V:--			
	Panogen O8 M					

Group No.	Name of Preparative Application Form	Active substance, content in %	Classification According to Regulations Concerning Poisons, Ways of Entry, Harmfulness to bees	Safety Measures	Symptoms of Poisoning	Special Provision for First Aid and Remark
b) Special mordants						
	Wet Germisen M	phenylmercuripyrrocatechinate of sodium 70	poison, D.Z.P. V:-- ZS, D.Z., irritates V:--	When we use a preparative of the TMTD type: Dustproof respirator and rubber gloves. Do not drink alcoholic beverages 24 hours after work and before work. Wet mordants; working suit, rubber gloves -- also respirator RC 643 with an insertion piece against organic vapors when we clean the instrument.	In the case of TMTD: irritates skin and mucous membrane. Under the simultaneous influence of alcohol there are serious overall disturbances with danger than blood circulation may fail.	Do not give TMTD: irritates milk, resin oil, alcohol. Under hol.
	Formalin M	formaldehyde 40	ZS, D.Z., irritates V:--	Always use technically dustproof mordant apparatuses, work in rooms which are well ventilated. Make technical arrangements to maintain NPK (0.005 mg/l), and if this	Vapors irritate the mucous membrane	When consumed, do not cause vomiting, serve milk with raw white of the egg.

Group No.	Name of Preparative Application Form	Active substance, concentration in %	Classification According to Regulations Concerning Poisons, Ways of Entry, Harmfulness to bees	Safety Measures	Symptoms of Poisoning	Special Provision for First Aid and Remark
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cannot be done: (lachrymation, coughing) and skin, chronic influence may result in catarrh of the conjunctive, the mucous membrane of the nasal cavity, and skin rash. When spilt on the body it corrodes skin, and when consumed it corrodes the digestive tract in the same way as acids.

c) Preparatives for treatment of sowing seeds against soil pests.

Gamanal M	gamaisomer	ZS, D.Z., irri-	Same as sub point 3 c.	Same as sub point 3 c.	Same as sub point 3 c--	Endrin
Alvit 55 M	Dieldrin	HCH 20 tates V:--	point 3 c--	Same as sub point 3 c--	point 3 c--	Endrin
Incrustation preparative "Schering"	Dieldrin	9 poison, D.Z.P. V:--	point 3 c--	point 3 c--	point 3 c--	Endrin
Hermal L M	TMTD	50 ZS, D.Z.P., irri-	Same as sub point 1 b--	point 1 b and 3 c.	Same as sub point 3 c--	Endrin
Dieldrex B M	Gama ECH	40 tates V:--	point 1 b--	point 1 b and 3 c.	Same as sub point 3 c--	Endrin
	Dieldrin	75 TMTD	point 1 b--	point 1 b and 3 c.	Same as sub point 3 c--	Endrin
	TMTD	10 poison, D.Z., irri-	Same as sub point 3 c--	point 3 c--	point 3 c--	Endrin

Group No.	Name of Preparative, Application Form	Active substance, content in %	Classification According to Regulations, Concerning Poisons, Way of Entry, Harmfulness to bees	Safety Measures	Symptoms of Poisoning	Special Provision for First Aid and Remark
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## 2. Fungicidal preparations

### a) Cupric

in % Cu

Aerosol Cu 25	A	cuprous oxide 25	ZS. A.Z. irri-tates V:N	Protective aids: Dustproof overalls, rubber or leather gloves, shield made of plexiglass. Waterproof coat as needed for spraying.	Headache, pains behind the thorax bone, feeling of suffocation. After consumption there is vomiting of the blue content of the stomach, sometimes including blood, general weakness, spasmodic pains of the belly, diarrhea.	
Banacobre OL	S	cuprous oxide 50	ZS. D.Z. irri-tates V:N			
Coloidox	S	cupric oxy-chloride 27	ZS. D.Z. irri-tates V:N			
Kuprikol	S	cupric oxy-chloride 30	ZS. D.Z. irri-tates V:N			
Coprentol	S	cupric oxy-chloride 50	ZS. D.Z. irri-tates V:N			
Kupritox 30	S	cupric oxy-chloride 30	ZS. D.Z. irri-tates V:N			
Niroxyd	P	cuprous oxide 8	O. D.Z. irri-tates V:N			
Oleocnivre	S	cuprous oxide 40	ZS. D.Z. irri-tates V:N			
Vitigran	S	cupric oxy-chloride 50	ZS. D.Z. irri-tates V:N			
Blue vitriol	S	cupric sulfate 25	ZS. D.Z. irri-tates V:N			

### b) Sulfate

Polybarit	S	barium polysulfides 20	ZS. D.Z. irri-tates V:N	Colloidal sulphur: Dustproof overalls, When consumed they cause antichemical goggles, rubber gloves, burning in the dustproof respirator. north and During spray use a heartburn,		
Sulka	S	calcium polysulfides 14	ZS. D.Z. irri-tates V:N			
Sulikol	S	colloidal sulphur 48	O. D.Z. irri-tates V:N			



Group No.	Name of Preparative, Application Form	Active substance, content in %	Classification According to Regulations Concerning Pesticides, Way of Entry, Harmfulness to bees	Safety Measures	Symptoms of Poisoning	Special Provision for First Aid and Remark
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Sulikol K	S	colloidal sulphur 50	O. D.Z. irritates V:N	shield made of plexiglass, waterproof hat, rubber gloves, and an apron. In the case of polysulphides use and walking also dustproof clothing, respiration RC 643 with an insertion piece against organic vapors.	stomach and bellyache, urge to vomit, heart activity slows	
Thiovit	S	colloidal sulphur 75	O. D.Z. irritates V:N			
Sulphur Sfinx	P	micro-ground sulphur 75	O. D.Z. irritates V:N			

c) Organic

Heryl	S	TMED 80	ZS. D.Z. irritates V:--	Same as sub point 1 b -- TMED.	Same as sub point 1 b -- TMED.	Do not serve fats, milk, alcohol!
Brestan	S	Zinc trifluoroacetate 20	ZS. D.Z. V:N	Brestan: same as sub point 2 a, when handling concentrate use also a mask with filter against organic vapors.		
Karathane	S	Karathane 25	ZS. D.C. V:N			

Group No.	Name of Preparative Application Form	Active substance, content in %	Classification According to Regulations Concerning Pesticides, Way of Entry, Harmfulness to bees	Safety Measures	Symptoms of Poisoning	Special Provision for First Aid and Remark
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Novozir N S	Zineb	27	ZS. D.Z. V:N	Dust: dust-proof overalls or working suit which is tight on the wrists and at the neck. During spraying and when handling a concentrate, use protective shield made of plexiglass, rubber gloves, water-proof apron or overcoat.		
Novozir N 50 S	Zineb	50	ZS. D.Z. V:N			
Novozir N dust	P Zineb	10	ZS. D.Z. V:N			
Aspor bleu	S Zineb	80	ZS. D.Z. V:N			
Tritoforol	S Zineb	70	ZS. D.Z. V:N			

3. Insecticides  
a) Inorganic  
Aredyn S

Calcium arsenate	Calcium arsenate	90	calcium arsenate poison, D.Z.P., irritates V:N	Respirator RC 643 with an insertion piece against organic vapors, antichemical goggles or face shield, strong diarrhea, head cover, scarf on neck, waterproof overcoat, rubber gloves, and high rubber boots.	When consumed: metallic taste in mouth, pale skin, cold sweat, continued vomiting, strong diarrhea, bellyache, convulsions.	
Calcium arsenate	Calcium arsenate	95	calcium arsenate poison, D.Z.P., irritates V:N			

Group No.	Name of Preparative, Application Form	Active substance, content in %	Classification According to Regulations Concerning Poisons, Way of Entry, Harmfulness to bees	Safety Measures	Symptoms of Poisoning	Special Provision for First Aid and Remark
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b) Of vegetable origin  
 Nikoten S nicotine 20 Poison D.Z.P. same as V:S sub point 3 a

sneezing, coughing, coughing of blood, strong headaches, dull pain in hands and feet. Further course may be identical with poisoning due to consumption. When the effect is chronic, there may be skin changes, inflammation of the nerves.

Headaches, giddiness, feeling of uneasiness, salivation, cold sweat, heart beat, vomiting, diarrhea, difficult breathing, reduced body temperature. In serious cases the patient is unconscious, has a feeling of suffocation, convulsions, breathing and heart beat stop.

Group No.	Name of Preparative, Application Form	Active substance, concentration in %	Classification According to Regulations Concerning Pesticides, Way of Entry, Harmfulness to bees	Safety Measures	Symptoms of Poisoning	Special Provision for First Aid and Remark
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c) Based on chlorinated carbonates.						
Dynocid P	DDT	5	ZS. D.Z. V:J	Protective means: During spraying: face shield, dustproof respirator.	After consumption: tingling sensation in the tongue and lips. Lassitude, tiredness, headaches, giddiness, trembling, convulsions.	Do not serve milk, fats, alcohol!
Dykol S	DDT	50	ZS. D.Z. V:J			
Dynol S	DDT	20	ZS. D.Z.F.V:J			
Aerosol						
DDT A	DDT	10	ZS. D.Z.P.V:J			
Gamaryl S	Lindan	80	ZS. D.Z., irritates			
Cyklo HCH P	HCH	tech. 10	ZS. D.Z., irritates			
Gamacid P	Lindan	1	ZS. D.Z., irritates			
Lindafum D	Lindan	20	ZS. D.Z., irritates			
Gamadyn P	DDT	2	ZS. D.Z. V:J			
Lidykol S	DDT	0.5	ZS. D.Z. V:J			
Aerosol DL A	DDT	2.5	ZS. D.Z.P.V:J			
Malipax P	Lindan	10	ZS. D.Z., V:N			
Endrin S	Endrin	20	poison, D.Z.P. V:J	Special regulations (see page 97 of the original). Report feeling of weakness within 24 hours before application to the district hygienist and veterinarian. Warning sign: treatment by poison, do not enter for a period of 4 weeks.	Headaches, dizziness, feeling of weakness, sleeplessness, feeling of uneasiness from the stomach, depression, lack of appetite.	

Group No.	Name of Preparation, Application Form	Active substance, content in %	Classification According to Regulations Concerning Poisons, Way of Entry, Harmfulness to bees	Safety Measures	Symptoms of Poisoning	Special Provision for First Aid and Remark
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Protective aids: spasms  
Complete anti-chemical suit or protective gloves, high rubber boots and rubber overcoat, scarf on the neck, waterproof head cover and protective mask with filter against organic vapors.

d) Based on organic compounds of phosphorus

Fosfotion S	Malation 33	ZS. D.Z.P.V:J	Poisonous preparations are covered by public notice no. 37-76044/1960.	Headaches, feeling of uneasiness, salivation, dizziness, vomiting, diarrhea, daze, bellyache, difficulty in breathing, 0.5 mg of atropine each, repeat in intervals of 30 min. by serving 1 tablet of atropine until the pupils
Intration S	Thiometon 50	" D.Z.P.V:S	" "	" "
Intrasol 3 A	Thiometon 3	" D.Z.P.V:S	" "	" "
Intrasol 10 A	Thiometon 10	" D.Z.P.V:S	" "	" "
Phosdrin S	Phosdrin 24	" D.Z.P.V:S	" "	" "
Terrasytam Z	Dimefox 50	" D.Z.P.V:S	" "	" "
Wofatox P,S	Methylparathion 2.5	" D.Z.P.V:J	" "	" "
Diazinon S	Diazinon 18	" D.Z.P.V:J	" "	" "
Soldep S	DTHP 40	ZS. D.Z.P. V:S	" "	" "
Aerosol DTHP A	DTHP 5	ZS. D.Z.P. V:S	" "	" "
Teration Z	Trend of organic compounds of phosphorus 50	poison, D.Z.P. V:S enter! Protected aids for work with a concentrate, soil aerosol, closed areas;	Attention, treated by poison! Do not enter! Protected aids for work with a concentrate, soil aerosol, closed areas;	muscle spasms, unconsciousness.

Group No.	Name of Preparative, Application Form	Active substance, content in %	Classification According to Regulations Concerning Poisons, Way of Entry, Harmfulness to bees	Safety Measures	Symptoms of Poisoning	Special Provision for First Aid and Remark
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Wofatox Staub P	Methylparathion 2.5	poison D.Z.P. V:J	complete anti-chemical suit or rubber gloves, high boots, protective suit with rubber overcoat, scarf on the neck, and waterproof head cover, protective mask with filter against organic vapors AV. Open space: respirator RC 643 with an insertion piece against organic vapors, antichemical goggles, plexiglass shield, working suit, fisherman's hat, rubber overcoat, gloves, boots, scarf on the neck. In the case of watering the degree of the necessary protection of the respiratory organs depends on the type of application and climatic conditions. However, it is always necessary to protect fully the skin and the eyes. Maximum working time 8 hours, with mask, maximum 4 hours.	soning	dilate. Do not serve more than 5 times. Do not serve milk, fats, alcohol!
Wofatox S	Methylparathion 30	poison D.Z.P. V:J			

Group No.	Name of Preparative, Application Form	Active substance, concentration in %	Classification According to Regulations Concerning Poisons, Way of Entry, Harmfulness to bees	Safety Measures	Symptoms of Poisoning	Special Provision for First Aid and Remark
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e) Gasifying preparatives.

Pilomor	Trichlorethylene 95 carbon disulfide 5	ZS. D.Z.P. irritates V:--	Protective aids: mask with filter against organic vapors, rubber gloves, boots, working suit. Observe regulations concerning gasification according to public announcement no. 234/1959 of Uredni List (Official Gazette).	Headaches, dizziness, pains in throat, tickling feeling in the body, daze to the point of drunkenness, feeling of uneasiness, irregular breathing to the point of unconsciousness. Burns appear when spilt on skin and consume alcohol and mucus membrane. Meals containing fats!	Do not serve milk, fats, alcohol! Affected skin should be also washed with 3% acid sodium carbonate.
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4. Preparatives for treatment of fruit trees and bushes during period of vegetative rest

Arborol S	DNOK 7 Anthracene oil 55	ZS. D.Z.P. irritation V:J	We should work in an open space when we dilute the concentrate. Protective aids	Feeling of thirst, sweating, drowsiness, restlessness, accelerated pulse and breathing, shadow,
Arborol AC S	DNOK 7 Anthracene oil 55	ZS. D.Z.P. irritation V:J		

Group No.	Name of Preparative, Application Form	Active substance, concentration in %	Classification According to Regulations Concerning Poisons, Way of Entry, Harmfulness to bees	Safety Measures	Symptoms of Poisoning	Special Provision for First Aid and Remark
Nitrosen S	PCPS 3 DNOK 25		poison, D.Z.P. V:J	when we dilute the concentrate: AV mask with filter or RC 643 respirator with insertion piece against organic vapors, plexi-glass shield, rubber boots, gloves, and an apron. During spraying: respirator and the rest is the same as when we dilute a concentrate, also use waterproof hat. Protect uncovered parts of skin with Indulona N-034.	increased temperature up to 40°C, spasms. After consumption: vomiting, bellyache, diarrhea.	apply cold compresses in case of high temperatures. Serve adequate amounts of liquids. Do not serve milk, fats, alcohol!
Karnofer S	Mixture of repellent material (coumarone, "kumariova", resin, waste obtained after isolation of Gamma HCH, ammonia fatty acids, etc.).		ZS. D.Z. irritates V:--			



Group No.	Name of Preparative, Application Form	Active substance, concentration in %	Classification According to Regulations Concerning Pests, Way of Entry, Harmfulness to bees	Safety Measures	Symptoms of Poisoning	Special Provision for First Aid and Remark
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5. Preparative for disinfection of soil (against wireworms, grubs, and cabbage fly).

Supergam DP	Lindan 0.5 superfosfat	O. D.Z. irritates V:--	Protective aids: Irritates skin, dustproof respiratory tract, and mucous chemical goggles, membrane. Acute dustproof overalls, poisoning head cover, scarf, does not occur. and gloves for work involving dusting -- observe principles of personal hygiene. Same as sub point 2 c -- Zineb.
Nematin DP	Sodium monomethylidithiocarbamate 40	ZS. D.Z. V:--	

6. Preparatives for special use.  
a) Against red spider mites.

Arafosfotion S	Malation 26 PCPS +19	ZS. D.Z.P. V:J	Same as sub point 3d.	Same as sub point 3 d.	
Tedion V 18 S	Tetradifon 8	ZS. D.Z.P. V:N	Protective aids: After inhalation or rubber gloves, consumption of larger overcoat, boots, doses: headaches, feeling of uneasiness, irritability, in case of heavy poisoning there are spasms.		

Group No.	Name of Preparative, Application Form	Active sub- stance, con- tent in %	Classification According to Regulations Concerning Poi- sons, Way of Entry, Harmful- ness to bees	Safety Measures	Symptoms of Poi- soning	Special pro- vision for First Aid and Remark
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b) Against snails and slugs

Limacid N	Metalddehyde 5	5	ZS. D.Z. V:--	Same as sub point 1 b -- formaldehyde.	Same as sub point 1 b -- formaldehyde.	
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c) Grafting wax for grafting, inoculation, and treatment of wounds on fruit trees.

Ceramin	--	0				
Jenten	--	0				

d) Caterpillar limes.

Sotor	--	Mixture of resins, wax, and oils	0			
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e) Auxiliary substances.

Adhesin	Reduced glue	0	V:--			
Afretan	Reduced glue	0	V:--			

7. Weed-exterminating preparatives.

a) Based on triazines.

Atrazine	S	atrazine	50	ZS. D.Z. V:N	Triazines:	Triazines:
Simazine	S	simazine	50	ZS. D.Z. V:N	For spraying use	Headaches, feeling
Zeazine	S	simazine	50	ZS. D.Z. V:N	a working suit,	of uneasiness, irri-
Gesagart	S	prometrin	50	ZS. D.Z. V:N	rubber gloves	tability, sleepless-

Group No.	Name of Preparative Application Form	Active substance, concentration in %	Classification According to Regulations Concerning Poisons, Way of Entry, Harmfulness to bees	Safety Measures	Symptoms of Poisoning	Special Provision for First Aid and Remark
	Hungazine DT S	simazine 50	ZS. D.Z. V:N	and boots, protective shield, head cover.	ness, in case of heavy poisoning spasms.	
	Hungazine PK S	atrazine 50	ZS. D.Z. V:N			

b) Based on fenoxycetate and fenoxyl-butter ("fenoxymaseline") acid.

Agrion	S	2.4 D	80	ZS. D.Z.P. V:S	Same as sub point 7 a.	Headaches, lack of appetite, irritation of skin and mucous membrane.
Dikotex	40 S	MCPA	10	ZS. D.Z.P. V:S		
Dikotex P	S	MCPA	80	ZS. D.Z.P. V:S		
Legumex D	S	2.4 DB	30	ZS. D.Z.P. V:S		
Legumex M	S	MCPB	30	ZS. D.Z.P. V:S		

c) On the basis of carbanates.

Prevenol conc.	S	CIPC	40	ZS. D.Z. V:S	Same as sub point 2 c.	
Liro CIPC	S	CIPC	40	ZS. D.Z. V:S		

d) On the basis of DNBP and DNOK.

Dinoseb	S	DNBP	20	poison D.Z.P. V:J	Same as sub point 4 -- DNOK	Same as sub point 4
Rafex 35	S	DNOK	35	poison D.Z.P. V:J		

e) Other

Allisan	S	potassium cyanate	90	ZS. D.Z. V:S	Same as sub point 4	Shyness to light, lachrymation, irritation of the nasal cavity, mouth, and
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Group No.	Name of Preparative Application Form	Active substance, content in %	Classification According to Regulations Concerning Pesticides, Way of Entry, Harmfulness to bees	Safety Measures	Symptoms of Poisoning	Special Provision for First Aid and Remark
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upper respiratory tract.  
Damages skin by direct contact (browning, hardening to the point of corrosion).

Agropyr S TCA -- Na 44-50 ZS. D.Z. V:8 Same as sub point 7 a.

Alipur S OMU, BIPC 16,11 ZS. D.Z.P. V:-- Special training for workers. Reporting 24 hours before application to the district hygienist.

Murbetol S Endothal 14 IPC 8, 5 ZS. D.Z.P. V:--

8: Preparatives for extermination of weeds on nonagricultural land (total herbicides).

Chlorotox S mixture of fenols 65 ZS, D.Z.P., irritates V:8  
 Protective aids: Corrosion of skin Do not induce high boots, suit Burning sensation in vomiting. designed only for mouth and chest, sharp After work with chemicals, pains in the abdomi- consumption waterproof overcoat, nal cavity, uncon- sumption waterproof head sciousness. Danger serve cover, scarf on the that blood circu- animal neck. Anti-chemical lation may full, charcoal goggles or face shield. inflammation of in tepid lungs, damage of water, white of kidneys. the egg.

Group No.	Name of Preparative Application Form	Active substance, content in %	Classification According to Regulations Concerning Pesticides, Way of Entry, Harmfulness to bees	Safety Measures	Symptoms of Poisoning	Special Provision for First Aid and Remark
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Travex S sodium chlorate 50 % ZS. D.Z., irritates V: S Same as in case of chlorotox, explosive!  
 Irritation to the point of corrosion of skin and mucous membranes, blood poison (if consumed).

Do not serve milk, fats, alcohol!

#### 9. Preparatives against rodents.

Neratox N Warfarin 1 % ZS. Z. V:--  
 Protective aids: Blood coagulation slows down, there working suit used is danger of internal hemorrhage only for this purpose.  
 After consumption there is burning sensation in mouth, throat, compulsion to vomit, squeezing pains in stomach, diarrhea, pains in feet, disturbances of heart action.  
 Accelerated breathing, feeling of uneasiness, vomiting.

Odraforte N Sea onion -- ZS. D.Z. V:--  
 Same as for Neratox

Dirax N ANTU 30 % ZS. Z. V:--  
 Same as for Neratox

Group No.	Name of Preparative Application Form	Active substance, content in %	Classification According to Regulations Concerning Poisons, Way of Entry, Harmfulness to bees	Safety Measures	Symptoms of Poisoning	Special Provision for First Aid and Remark
	Antimur N	zinc phosphide 10	poison, D.Z. V:--	Same as for Neratox, and	Headaches, dizziness, vomiting, diarrhoea, restlessness, fever, weak pulse. Irritation of respiratory tract,	
	Azena N	zinc phosphide 4	poison, D.Z. V:--	In addition we must use a mask with filter	or swelling of lungs after inhalation of hydrogen phosphide.	
	Moratox N	zinc phosphide 80	poison, D.Z. V:--	against organic vapors when we work in premises		
	Grain nera N	zinc phosphide 2.5	poison, D.Z. V:--	which are poorly ventilated or humid.		
	Virtus N	zinc phosphide 80	poison, D.Z. P. V:--	Same as sub point 3 c --	Same as sub point 3 c --	Take the patient out in fresh air, keep him physically at rest.
	Endrin 20 S	Endrin 20	poison, D.Z. P. V:--	Endrin.	headaches, pains under the thorax bone, coughing.	
	Neragen D	SO <sub>2</sub> , C ,	ZS, D. V:--	Protective aids: anti-chemical goggles, working suit. Use only in open area which are well ventilated.		

10. Preparatives against diseases caused by lack of trace ("stopove") elements

Borax  
Sodium molybdenate

## Explanations of Symbols

### Form of Application:

P = powder	N = bait
S = spray	D = smoke box
A = aerosol	Z = watering
M = soaking, macerating	DP = disinfection of soil

### Harmfulness of Preparative to bees:

J = poisonous	-- = harmfulness does not
S = noxious	come in consideration
N = relatively harmless	in view of the time
	or method of appli-
	cation.

### Classification of Preparative:

Jed = poison  
ZS = harmful to health  
O = not classified as poison or substance harmful to health  
within the meaning of the corresponding regulation.  
irritates = irritates undamaged skin.

### Ways of Entry in Organism:

P = skin  
Z = digestive organs  
D = respiratory organs

### Note Concerning Safety Measures With Regard to Murbetol (page 82):

#### Protective Aids:

Rubber gloves and high boots, suit designed only for work with chemicals, waterproof overcoat, waterproof head cover, scarf on the neck. Anti-chemical goggles or face shield.

When we handle a concentrate, we use a AV mask with filter. During spraying we use a RC 643 respirator with an insertion piece against organic vapors, unless we can eliminate reliably the possibility of being affected by the dust.

	1 Adhesin	2 Arafosfotion	3 Bord. mixture	4 Dykol	5 Fosfotion	6 Intration	7 Karathane	8 Kuprikol	9 Lidylol	10 Novozirn	11 Phosdrin	12 Polybarit	13 Soldep	14 Sulikol	15 Sulka	16 Tedion
Adhesin	1	0	M	M	0	0	M	M	M	M	0	M	0	M	M	0
Arafosfotion	2	0	X	M	0	0	?	?	M	M	0	?	0	M	?	0
Bord. mixture	3	M	X	R	X	R	?	0	R	?	X	X	?	M	X	M
Dykol	4	M	M	R	M	M	0	M	0	M	0	?	0	M	?	M
Fosfotion	5	0	0	X	M	0	X	?	M	M	0	?	0	M	?	0
Intration	6	0	0	R	M	0	0	M	M	M	0	?	M	M	?	0
Karathane	7	M	?	?	0	X	0	?	0	M	?	0	0	0	0	?
Kuprikol	8	M	?	0	M	?	M	?	M	?	?	X	0	M	X	M
Lidylol	9	M	M	R	0	M	M	0	M	M	0	?	0	M	?	M
Novozirn	10	M	M	?	M	M	M	?	M	M	?	X	0	M	X	M
Phosdrin	11	0	0	X	0	0	0	?	?	0	?	0	0	0	X	0
Polybarit	12	M	?	X	?	?	?	0	X	?	X	0	0	0	0	0
Soldep	13	0	0	?	0	0	M	0	0	0	0	0	0	0	0	0
Sulikol	14	M	M	M	M	M	M	0	M	M	M	0	0	0	0	0
Sulka	15	M	?	X	?	?	?	0	X	?	X	X	0	0	0	0
Tedion	16	0	0	M	M	0	0	?	M	M	M	0	0	0	0	0



- M -- mixible.
- R -- mixible, but the mixture decomposes quickly, should be used immediately.
- ? -- mixibility questionable, generally not recommended.
- X -- not mixible.
- O -- mixing does not come in consideration.

Note: The preparatives must not be mixed in the form of their concentrates, but only after they have been diluted in water. We never prepare mixtures for storage, but always immediately before we use them, and we use the mixtures as quickly as possible.

[pages 88-89 not available]

...S-050/1 with axial ventilators). The operational reach is 9 m (it will be increased to 12 m), the doses are 200-900 liters/ha. Output per shift is 15 ha or 300-500 trees. The machine is operated by one to three workers. Manufacturer: BBG Leipzig, GDR (German Democratic Republic).

Note: machines marked by an asterisk have been tested by SZZLS and UKZUZ with positive results.

#### Cleaning and Disinfection of Equipment Used for Protection of Plants

##### Spraying Machines

##### 1. Each day immediately after work

##### a) On the treated lot:

- We release any leftover of the spray liquid (we observe all the prescribed safety measures),
- We rinse the container of the spraying machine with water,
- We wash with water or mordant + the external parts of the machine and also of the tractor, if the tractor came in contact with the spraying substance during the treatment.

##### b) On the washing platform:

- We open the outlet and spray the inside walls of the container thoroughly with water under pressure.
- We close the outlet and fill the container partly with pure water.
- We run the motor for about 2 minutes, so that the sprayguns would be washed with water.
- We let the rest of the water out of the container.

Note: If we do not have cleaning water under pressure at our disposal, we fill the container of the spraying machine completely with water, let it mix for 5 minutes, then run the motor for about 2 minutes so that the sprayguns would be washed, and we release the rest of the water from the container by opening the outlet. If there is a shortage of water, we can leave the rest of the water in the container until next day and use it to prepare the spray liquid.

## 2. When we change the spray substance (preparative)

In addition to the operations described sub point 1 a and 1 b, we also do the following:

- We fill the container completely with water or with a mordant liquid\*.
- We let it mix for 15 minutes.
- We run the motor (at least for 5 minutes) and wash the spray-guns with water or mordant liquid\*.

\* If instructions say so. Details concerning the use of mordant as well as the type of mordant substance and the method of application are indicated on the labels of individual preparatives.

- We release the rest of the liquid from the container by opening the outlet.
- We wash thoroughly the external parts of the machine and tractor by using water under pressure.

If we use the spray machine to apply some herbicide, we repeat this procedure once more. If we use herbicide based on growth substances (Dikotex, Agrion, etc.), we add activated charcoal while we fill the container with water, so that we would have a 1% suspension.

### Dusting Machines

We clean dusting machines regularly every day, immediately after the end of a work shift. The cleaning of dusting machine consists of the following:

- Complete removal of remnants of the preparative from the magazine.
- We blow air through the powder ducts and nozzles (idle running of the machine for 2 minutes).
- Cleaning of external parts of the machine and tractor.

We can clean the external parts by using a broom (brush), cloths, or water under pressure. However, if we use this method we must make sure that water does not penetrate in the magazine of the dusting preparative.